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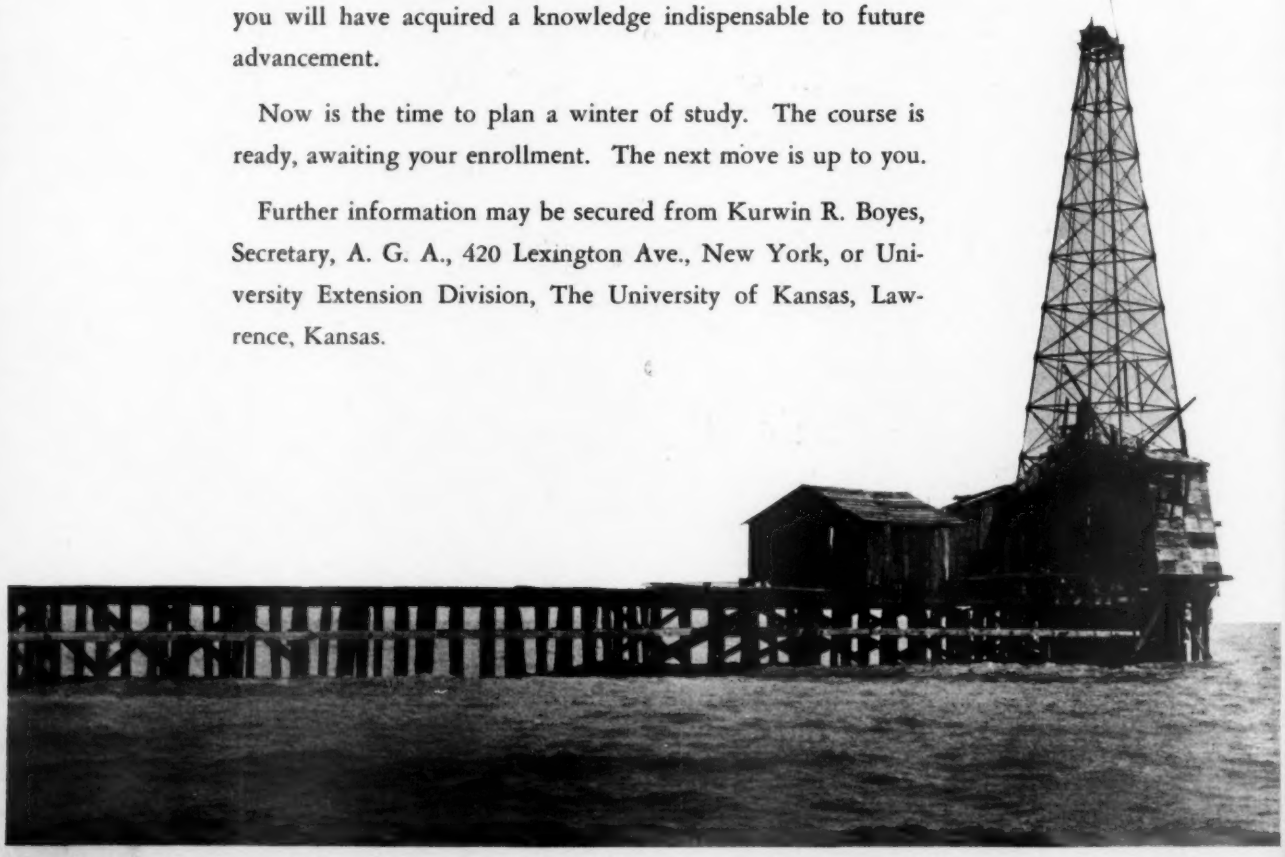

Natural gas producing well in Lake Erie, near Port Alma, Ontario, drilled in 1931

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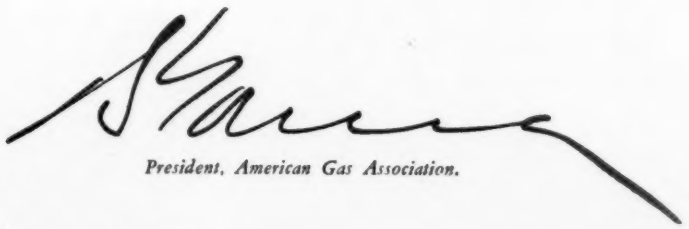
A New Year's Message

THE year 1935 calls for continued effort along the lines that the gas industry has consistently followed since the depression. The situation has developed sufficiently so that we are able more clearly to see the importance of greater definiteness of policy and, therefore, to make better progress in cooperative action towards business recovery. That seems to be the industry's duty and opportunity for 1935.

The economic stability of the gas business has frequently been pointed out and has been further fostered by recent improvements in gas manufacture. Nevertheless, the industry must be on guard against unwarranted impositions of governmental charges that would unfairly affect its consumers, or place the industry in an unfavorable competitive position.

The industry has cooperated to the fullest extent with all governmental activities for the advancement of the general welfare. It has allowed no selfish interest to stand in its way. It is not so much new measures that are needed but more diligent application of measures found in the past to be sound and effective, both to business as a whole and the gas business in particular, if we are to make the progress we all so much desire. We should not hesitate courageously to apply such measures. Our sales departments should be amplified. Confidence begets confidence. Enterprise should be our contribution to recovery. It is good business for this industry to plan its way out of this depression through energetic measures to promote sales and, wherever possible, decrease its cost of service to consumers. The lowest possible price, compatible with the best service, is generally recognized by the gas industry as good business policy. It promotes a sound business base, good relations with customers and must be founded on fair treatment to the investor and the worker.

The industry must join in every activity that is calculated to promote gainful employment and I urge upon the industry positive leadership in cooperative action to the extent of its resources, as well as intensive effort within its own particular field, in order to hasten the recovery in business which is so essential to the nation's welfare.



President, American Gas Association.

AMERICAN GAS
ASSOCIATION
MONTHLY

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James M. Beall, Editor

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Three "R" Sales Program for the Gas Industry

By HALL M. HENRY

Utility Management Corporation, New York, N. Y.

Hall M. Henry

THE depression has had a sobering effect on the American people, so that they now make a more careful investigation before they buy. What is of even greater concern to us, perhaps, is the fact that we have had an opportunity during these past three years to get our bearings and make ready for the forthcoming struggle over the fuel market. If we are not now prepared or do not take the time which remains before the American people again start on a spending spree to prepare our defense or offense, we will find our progress to greater sales materially retarded and we must expect to see some business lost to our competitors.

Present Status

These questions each of us must answer: Are we prepared? Just what is our present status? What are the factors that enabled electricity and other competitors to make inroads into some gas situations? What can we do in the time that remains for us to prepare our industry to cope with the situation?

Let us analyze each of these and see if we can arrive at satisfactory answers. First, what is our present status?

Before we look into this we should call this fact to mind: the gas industry progresses only by displacing competitive fuels and services. In other words, we are in continuous competition with other fuel interests besides being in competition with the manufacturers of appliances and equipment which make use of these competitive fuels. There is one other fact peculiar to our service which we should keep in mind—a gas appliance seldom causes dissatisfaction by becoming instantly inoperative, as electric appliances have a habit of doing. Gas generally gives some kind of service at all times. Due to this characteristic, a customer is in many instances confronted with poor service from her gas appliance extending over a period of time, which, of course, produces anything but a favorable reaction.

Now bearing these two thoughts in mind, namely, competition and service, we can proceed to picture the present status of our gas companies, and then proceed to find a solution to our gas problems.

The gas industry was able to displace competitive fuels in the past, although gas cost many times the competitive fuel on a therm basis, because the gas industry and the gas appliance manufacturers built more efficient appliances and appliances more susceptible to control than did the competitive fuel appliance industry. The fuel industries competitive with gas took it lying down until, suddenly, they began to realize that unless they did something about the situation, they would be left out entirely. They have made such a fine comeback from the equipment standpoint that the gas industry finds it is on the defensive for the first time to hold the business captured from its competitors, and, in addition, is confronted with a new competitor for the fuel market—electricity.

Domestic Cooking Field

The oil and electric industries are aggressively fighting for the gas cooking load, and nearly every gas company has seen some of its cooking load taken over by coal or oil interests. The gas industry finds itself in the same position as did the competitive fuel industries at the time the gas industry displaced the competitive fuels, namely, with 85% to 90% of its present gas range users equipped with old inefficient gas ranges which are without heat control and insulation. The top burners of old style gas ranges are not over 30% to 35% efficient. Yet, present-day ranges are from 45% to 52% efficient (electric top burners are only 54%). However, customers judge gas by the way it performs in the range they now are using, and their judgment is bound to be detrimental to gas (in comparison, say,

Paper delivered at Indiana Gas Association Convention, Nov. 16, 1934.

with electricity) if their present ranges do not show off gas in the most favorable light.

Kitchen Heating

In the kitchen the gas cooking load is in many instances a summer load only. This is because there is no method of heating the kitchen other than by the range. Hence, many ranges are combination gas and coal, the customer using coal in the winter for cooking and for heating the kitchen. However, the oil man has been active, and in some localities has made great progress in installing oil burners in the coal firebox. The result is that we find where oil is used, it is in many instances used both summer and winter. Yet there are available various types of burners which can be used to convert coal ranges to gas for heating purposes and some manufacturers now offer a combination range which uses gas for heating instead of coal. To illustrate the importance of this phase of our business, a survey of one property of 6,400 homes showed 65% had no means of heating the kitchen except by the kitchen range, and only 50% of the gas customers were twelve-month customers.

Domestic Water Heating

In this field the coal, oil and electric industries are all active. Present-day oil water heaters are automatic in every respect, and in large installations give as satisfactory performance as do oil burners and boilers used for heating purposes. Furthermore, equipment is available which makes possible the heating of water in the summer time by means of the oil burner used for heating, and, as you know, most of the oil heating boilers now come equipped with a connection for heating water both summer and winter. There is also available a semi-automatic coal-fired water heater which requires coal every three days or so. The electric utilities are resorting to flat rates and off-peak rates which compare favorably with gas for water heating in many localities.

In the homes of customers using gas for water heating we find about 10% of our customers with automatically controlled gas water heaters, many of them inefficient, most of them improperly installed, a large number of the wrong type and many misconceptions regarding operating costs on the part of the public, employees, dealers and salesmen. We have some 50% or more using a manually operated tank heater. Yet, our competitors are pushing heaters automatically controlled and making exaggerated claims regarding the savings possible by using their fuel instead of gas.

Gas Refrigeration

In the refrigeration field gas is, of course, competing primarily with mechanical electric refrigeration. Fortunately, the new air-cooled gas refrigerator eliminates one of the major objections customers have had to gas refrigeration. We feel that the new air-cooled refrigerator is able to meet competition if given half a chance. This is clearly evidenced by the fact that in some of our own gas properties our local gas companies sold more gas refrigerators than all the electric dealers combined.

Domestic Heating

In the domestic heating field we have the following considerations:

What progress we have been able to make thus far has been due in a large measure to the inadequacy of coal and oil heating equipment.

Coal and oil heating equipment have been greatly improved in recent years, both from quality of service and from freedom of interruption in service because of mechanical failure.

The coal and oil industries have graduated from mere purveyors of a product to selling a heating service.

There is a definite trend on the part of oil heating equipment manufacturers to sell complete oil designed boilers and furnaces rather than conversion burners.

Many gas heating installations now on our lines do not render a greatly superior service to coal or oil. In many instances the quality of the gas heating service is inferior to that obtainable from present-day oil and coal heating equipment.

Gas equipment has been greatly improved within the past eighteen months to a point where it renders obsolete many existing gas heating installations.

New control equipment is available for gas which enables it to render a greatly improved heating service over coal or oil.

The "first cost" for gas heating equipment is less than for coal or oil heating equipment, yet a survey showed that 75% of the people interviewed thought gas heating equipment cost more than coal or oil heating equipment.

There are other costs than mere fuel costs that make up the total cost of heating by coal or oil or gas, but these are usually ignored by the average customer because he does not know the other factors should be considered.

The "average home" can be heated cheaper by gas (where gas rates are reasonably low) than by oil if the customer will spend as much for gas burning equipment and heat saving devices as he will have to spend for heating equipment (alone) to use oil. Yet few of our employees realize this fact, to say nothing of the general public.

The gas industry has the only truly air conditioning equipment available, although both the coal and oil equipment people are advertising air conditioning.

The architects and builders are a larger factor in heating equipment sales than most of us realize. For instance, 75% of all homes above $10,000 are handled through an architect and 50% of all homes between $7,000 and $10,000 are handled through a builder.

Many of our employees, to say nothing of the architects, builders, heating contractors, etc., think gas house heating is the most expensive of all fuels.

The primary sales appeal of the coal and oil people is one of low operating costs. Yet when all factors are considered gas may even prove cheaper.

While oil and coal prices are up few people know about it and that while gas rates have been reduced, few people know about it.

Here again the gas industry finds itself on the defensive. Equipment in customers' homes is not able to withstand successfully over a period of years the lower operating sales argument of coal stoker and oil heating equipment distributors, because there is little to choose between the two fuels and gas from the service point of view. However, here again we have

an effective weapon of defense, as well as of offense, namely, modern air conditioning furnaces and so-called modulating controls suitable only for gas.

Commercial Field

In the commercial field the oil and coal industries have improved materially the appliances which they have to offer, both in appearance and in reducing the cost of operation and also in improving the flexibility of the service. This improvement in oil and coal equipment has resulted in some replacements of gas for cooking and water heating. Here again, however, these replacements have in a large measure been due to the antiquated gas equipment which was in use in the establishments where gas was replaced by oil and coal. Again the gas appliance manufacturers have improved the efficiency and service obtainable from gas appliances, and the result has been a reduction in many instances of 50% in the amount of gas required for performing the same operation with the new equipment as compared with the old inefficient equipment. In fact, the efficiency of gas equipment has been improved to such an extent that we are still able to compete, where gas rates are reasonable, on a fuel cost basis with oil.

Industrial Field

The present industrial gas loads have had to meet competition not only from greatly improved oil and coal burning appliances, but also from butane and propane. While the industrial gas equipment in use is not as antiquated as some of the equipment and appliances in use on domestic and commercial gas loads, there has been a marked improvement in industrial gas equipment and particularly in the methods of utilizing gas. These improved methods are such that in many instances the competitive fuels, such as oil and coal, are unable to duplicate, although propane and butane can be utilized on these improved methods of heating. We also find a new method of combustion developed which enables the direct application of gas and gives a superior quality product than with the old gas applications. Fortunately, these improvements are not adaptable for oil or coal nor for butane. I refer particularly to the new diffusion combustion principle which has been developed.

Solution to These Problems

That, briefly, is the present status of our various gas loads. To some it may appear to be overdrawn, yet a careful study of the facts will readily disclose whether these conditions apply to your situation. The important fact to keep in mind is that we should know and not guess. At the beginning I stated the gas industry, in my judgment, could meet competition, yet there are known cases where apparently a gas company could not hold its cooking load. A study of such situations discloses the startling fact that these particular gas companies had not aggressively merchandised new gas ranges. In fact less than 10% of their customers had purchased new ranges in the past 10 years. Is it any wonder the electric utility could sell modern cooking to these customers? I hold that I could sell present day model electric automobiles in a territory where the inhabitants were still using 1915 gas-driven automobiles.

In another gas situation an electric utility has been successful in selling electric water heaters replacing gas heaters—the electric rate being 75 cents plus 1 cent per kw.hr. (off-peak service) and gas selling for under $1.00 per M. A study of this situation brings to light the fact that this gas company's customers have been sold gas water heaters which are not efficient—and no effort has been made by the gas company to replace these old inefficient heaters with modern efficient gas water heaters. Yet a present day gas water heater would in most instances save these customers 30% to 50% on their cost of heating water.

Three "R" Program

Now returning to our discussion of the present status regarding our various loads, we see that we have practically the same problems confronting us on each type of load we have. Furthermore, the solution, while differing in particular details or sales policies, is the same in principle. The problem as a whole can be summed up in what I term a Three "R" Program.

The first "R" stands for Recovery of lost business. As pointed out, we have suffered a loss in every department of our business with the single exception, probably, of gas refrigeration.

The second "R" stands for Retain, and I think we have a problem ahead of us in every phase of our business in retaining our present gas loads.

The third "R" stands for Replace and is quite appropriate in view of the fact, as pointed out previously, the gas industry only progresses by replacing competitive fuels. Hence, this third "R" is to Replace every competitive fuel on our properties with gas.

Before going into a detailed recommendation on a Three "R" Program for each phase of our business, it might be well to outline the general activities which should be carried on in connection with every phase of the gas business.

First: It is highly important that every employee, salesman and dealer be given the facts regarding comparative costs and advantages of gas in supplying a fuel for cooking, refrigeration, water heating, house heating, commercial and industrial uses. It is a sad commentary on the gas industry that it has failed to recognize the importance and value of keeping informed regarding the comparative cost of its service with that of competitive industries. I hold that in view of the nature of our business we should set up some agency to keep the industry informed on the comparative costs of competing services and gas. It is also a sad reflection on at least our new business managers that our executives are not fully informed as to just how we stack up from a competitive viewpoint. In fact, I am surprised to learn that many of them are not even familiar with the various types of appliances which we have to sell, and through which we hope to build our business. Furthermore, I have been greatly shocked over the ignorance prevailing among our employees. Can we hope to meet competition when our own organization is not fully advised on what our services cost, and how they compare with other competitive services? Should we not first put our own house in order and start with the top executives and carry on through to the rank and file employees in giving them a thorough grounding in what we have to offer?

(Continued on page 26)

Gas Summer Air Conditioning in the Treatment of Pollen Asthma

In the tests reported here the gas operated summer air conditioning apparatus used was that developed for residential air conditioning by the A. G. A. Committee on Industrial Gas Research. The theory of low relative humidity and moderate temperature reduction which has been the basis of most of the committee's air conditioning research is here applied to a large and important field other than summer comfort.

The extraordinary extent of the relief obtained by hay fever and asthma sufferers and the promptness with which this relief was obtained gives promise of an extensive use of dehumidified air in the homes and offices of the thousands of persons regularly affected by such pollen. Comparisons of the results obtained by using gas dehumidified air with the results previously obtained where emphasis was chiefly laid on extreme temperature reduction is of major interest and importance.

The distinguished members of the staff of the Departments of Physiological Chemistry and Medicine, College of Medicine of the University of Illinois have made an outstanding contribution to a subject of immediate interest, as a result of their painstaking research.

By TELL NELSON, M.D.
B. Z. RAPPAPORT, M.D.
A. G. CANAR, B.S.
WILLIAM H. WELKER, Ph.D.*

University of Illinois, College of Medicine

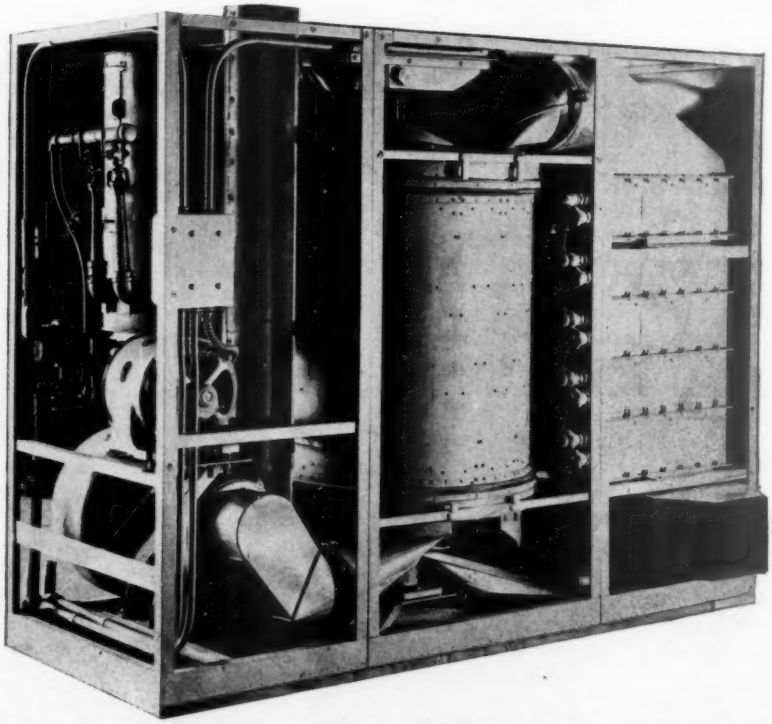
DURING the hay fever seasons of 1931 and 1932, we studied the effect of air filtration on the alleviation of symptoms of hay fever and pollen asthma on 181 patients.[1] We observed that relief from hay fever symptoms occurred in from fifteen minutes to several hours after entering our filtered air ward, but that relief from asthma depended upon the severity of symptoms. The time required for relief of symptoms of asthma varied from twenty-four hours to several days.

During the 1932 period of observation, it was noted that in spite of confinement in a pollen-free room, pollen asthma patients who were free of symptoms, developed attacks of asthma shortly after the occurrence of storms. These attacks were severe and lasted several days. This observation led us to conclude that other factors in addition to pollen were responsible for the occurrence of asthma in pollen sensitive individuals. The factors to be considered are: Increase in the relative humidity, changes in temperature, changes in barometric pressure or a change in the ionization of the air during storms.

In the experiments conducted during the 1933 pollen season and reported here, our ward was provided (in addition to equipment for filtration of the air) with equipment for the control of the relative humidity and temperature within narrow limits. The relative humidity was maintained between 15 and 30 per cent, and the temperature between 74 and 80 F., irrespective of the outdoor fluctuations.

Dehumidifying and Filtration Apparatus

The apparatus[2] used in this experiment consisted of three parts—a circulating system, a dehumidifying system and a filtration stystem (Fig. 1). Dehumidification was accomplished by a silica gel gas operated dehumidifying unit, which consisted of an absorber, an absorption fan, an after-



Silica Gel gas operated summer air conditioner used during tests at the University of Illinois College of Medicine

Reprinted from "Heating, Piping and Air Conditioning."

* From the Departments of Physiological Chemistry and Medicine, College of Medicine of the University of Illinois, Chicago, Ill.

[1] See "Filtered Air Relieves Hay Fever," by William H. Welker, B. Z. Rappaport, and Tell Nelson, "Heating, Piping and Air Conditioning," July, 1933, pp. 348-350.

[2] The authors wish to acknowledge the assistance rendered by The Peoples Gas Light and Coke Company, Chicago, in supplying and installing the equipment for dehumidification and cooling, and for the technical assistance rendered during the conduct of the experiment; and the assistance rendered by the American Air Filter Company, Louisville, Ky., in supplying and supervising the operation of the air filter units.

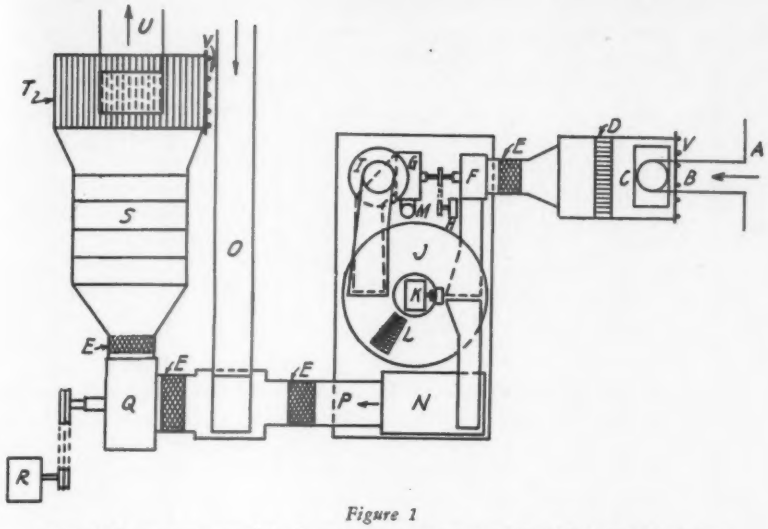


Figure 1

Plan of the apparatus used in the experiment, operation of which is explained here

A—Hospital ventilation duct
B—Fresh air duct to gel unit
C—Primary filter box
D—Primary filter—vertical position
E—Canvas connections
F—Absorption blower
G—Activation blower
H—Motor drive for absorption and activation blowers
I—Activation furnace
J—Silica gel cylinder
K—Motor drive for gel cylinder
L—Purge opening
M—Flue pipe
N—After-cooler
O—Return duct from conditioned area
P—Conditioned air duct from gel unit to circulating fan
Q—Circulating fan
R—Circulating fan motor drive
S—Finned water coil cooler
T—Secondary filter—horizontal position
U—Conditioned air duct to conditioned area
V—Access doors to filter boxes

cooler, an activation fan, and an activation furnace. The absorber consisted of a cylinder 36 in. in diameter and 24 in. high, mounted on a vertical shaft which is rotated by a motor and suitable speed reducer. The cylinder has stationery heads to which are connected the ducts leading from the fans, activation furnace and after-cooler. The gel cylinder is rotated 3 revolutions per hour by a speed reducer and a 1125 rpm., 1/12 hp. motor. The gel cylinder contains 24 pie-cut shaped sections, one-half of which are always absorbing moisture out of the air, while the balance are being activated —having the absorbed moisture driven off by passing hot furnace gases through them. Air to be dehumidified is forced through the gel beds by the absorption fan. The dried air leaves the absorber at a temperature of about 140-150 F., because the latent heat of vaporization is given off as the moisture condenses in the gel and thus raises the temperature of the air. This dried hot air then passes through the after-cooler where it is cooled to about 80 F. The after-cooler contains a finned water coil which utilizes the waste water from the main cooler to cool the treated air.

Activation of the spent gel is accomplished by passing hot gases of combustion plus considerable excess air through the gel, maintaining an inlet temperature of 300 F. so as properly to activate the gel. The hot gases for

TABLE I—ABSOLUTE AND RELATIVE HUMIDITY OF THE AIR BEFORE AND AFTER TREATMENT WITH SILICA GEL AND THE ABSORPTION EFFICIENCY OF THIS DEHUMIDIFYING AGENT: AND THE ABSOLUTE AND RELATIVE HUMIDITY OUT-OF-DOORS AND IN THE EXPERIMENTAL WARD AND THE DROP IN ABSOLUTE HUMIDITY IN THE AIR CONDITIONED WARD AS COMPARED TO THE OUT-OF-DOORS

		Air Intake at Dehydration Unit		After Silica Gel Treatment			Out-of-Door		In Experimental Ward		
Date	Time	Grains H_2O Per Pound of Air	Relative Humidity in %	Grains H_2O Per Pound of Air	Relative Humidity in %	Absorption Efficiency in %	Grains H_2O Per Pound of Air	Relative Humidity in %	Grains H_2O Per Pound of Air	Relative Humidity in %	Drop in Absolute Humidity in %
Aug. 21	9:30 a. m.	..	..	..	..	..	96	62	38	30	60.5
	11:00 a. m.	..	..	36	17	..	..	..	43	32	55.3
	11:30 a. m.	..	..	..	..	..	..	..	45	31	53.3
	5:30 p. m.	89	32	44	22	50.5	..	..	..	..	..
22	9:30 a. m.	83	30	30	16	64.0	89	70	41	30	54.0
23	11:00 a. m.	78	46	28	12	64.0	77	57	37	25	52.5
24	10:30 a. m.	84	47	34	20	62.3	90	62	43	43	48.0
25	12:00 n.	87	53	38	22	56.5	99	54	50	35	49.5
26	10:40 a. m.	72	38	25	16	65.3	74	74	38	28	48.8
27	2:00 p. m.	66	39	17	11	71.2	67	67	36	26	53.8
28	2:00 p. m.	36	27	31.5	19	57.7	75	75	36	27	51.8
29	10:50 a. m.	64.5	41	26	12	59.7	64	64	27.5	22	57.0
30	11:15 a. m.	62	39	19.5	9	68.5	68	68	30	22	55.8
31	5:10 p. m.	65	39	19	13	70.8	65	65	30	22	54.0
Sept. 1	5:00 p. m.	63	37	18	9	71.4	69	44	19	19	58.2
2	12:30 p. m.	84	50	31	16	63.2	86	56	40	28	53.5
3	5:15 p. m.	72	40	6.5	4	91.3	72	42	35.5	24	50.6
6	3:30 p. m.	69	33	20.5	15	70.6	70	28	36	23	48.7
7	11:55 a. m.	98	46	42.5	28	56.8	97	48	53.5	35	44.8
8	9:30 a. m.	89	47	32	22	64.0	91	48	43	30	52.8
9	10:25 a. m.	92	47	35	25	62.0	95	47	48	33	49.6
11	10:45 a. m.	70	42	20	16	71.8	72	78	34	27	52.6
12	9:50 a. m.	59	42	15	12	75.8	62	63	26.5	22	57.2
13	11:00 a. m.	60	43	15.5	13	74.3	60	68	22	18	63.3
14	10:15 a. m.	62	47	19	16	69.5	56	79	26	23	53.5
15	12:00 n.	64.5	43	17.5	14	72.8	65	80	27	23	58.3
16	11:10 a. m.	96	60	40	28	58.5	99	70	46	38	53.5
18	11:00 a. m.	44.5	25	9	8	80.0	46.5	36	18	16	61.3
19	3:00 p. m.	106	65	96	82	*	66	29	91	67	*
20	3:20 p. m.	40	26	11.5	10	71.3	42.5	41	19	17	55.5
21	2:00 p. m.	46	28	7.5	8	83.8	48	50	23	19	52.0
22	3:15 p. m.	83	64	33	27	60.5	86	80	39	34	54.6
23	11:20 a. m.	93	54	35	30	62.5	91	63	46	38	49.5
25	4:45 p. m.	106	64	47	38	55.5	106	68	57.5	44	45.7
26	11:15 a. m.	89	34	38	32	57.3	92	70	47.5	38	57.3
27	10:00 a. m.	49.5	30	11.5	10	77.0	48	55	24	20	50.0
28	12:45 p. m.	52.5	37	13	9	77.3	59	58	24.5	20	58.4

*Silica Gel Motor Drum Bearing burned out and had to be replaced. Unit shut down temporarily.

activation are furnished by a small gas furnace and are sucked through the gel beds by the activation fan, which is mounted on the same shaft as the absorption fan so that both of these fans are driven by one motor from a V-belt drive. The moisture-laden gases leaving the gel beds are conveyed by a copper flue to the outside of the building. Of the twelve gel beds being activated, nine are being hot-gas-treated for moisture removal while the other three are being purged and cooled by having air sucked through them.

As the gel cylinder slowly revolves, one gel section comes to activation while one activated and-purged section goes over to absorption again. By this means the absorption and activation is continuous with always twelve gel sections on absorption, nine sections on activation and three on purge.

The activation furnace consumes about 75 cu.ft. of 800 B.t.u. gas per hour. The hot gases of combustion are "toned down" to a temperature of 300 F. at the inlet of the gel cylinder by being diluted with excess air, which is taken in through an annular chamber surrounding the gas furnace. The amount of excess air is controlled by a damper in the flue close to the discharge outlet of the activation fan.

TABLE 2—POLLEN COUNTS AND FILTRATION EFFICIENCY OF FILTERING UNITS—1933

Date	I	II	III	IV	VI	VII
Aug. 21	0	2	0	..	35	123
22	0	1	4	3	..	73
23	0	1	2	1	22	51
24	4	2	1	1	65	297
25	3	2	3	2	65	287
26	0	7	2	7	55	242
27	1	2	4	1	28	190
28	4	5	2	0	17	54
29	1	2	0	0	38	158
30	1	2	0	1	105	228
31	2	4	0	0	265	775
Sept. 1	1	2	2	0	571	850
2	1	3	0	1	49	175
3	4	3	1	0	140	280
4	2	3	3	2	78	326
5	2	4	0	1	210	718
6	6	2	1	2	83	310
7	1	4	0	1	108	487
8	2	4	2	2	95	273
9	7	3	4	1	21	57
10	2	3	0	2	18	61
11	0	3	0	0	33	133
12	3	1	0	1	35	62
13	0	0	0	0	18	170
14	0	1	0	0	9	31
15	0	0	0	0	18	67
16	0	1	0	0	19	54
17	1	1	0	0	9	43
18	0	0	1	0	35	77
19	0	0	0	0	27	40
20	2	2	0	0	5	21
21	0	0	0	0	21	185
22	0	0	1	0	31	58
23	0	0	0	0	..	..
24	0	0	0	0	38	205
25	0	0	0	0	7	38
26	0	0	0	0	3	11
27	0	0	0	0	3	13
	50	70	33	27	2379	7223

I and II = Settling count in the filtered air ward.
III and IV = Counts taken from intake ducts in filtered air ward.
VI = Settling counts in control ward.
VII = Settling counts out of doors.
Filtration efficiency in comparison to outdoor pollen counts—99.17%.
Filtration efficiency in comparison to control room pollen counts—97.48%.

The circulating system consists of a circulating fan, a 4-section finned water coil cooler, a conditioned air delivery duct to the experimental ward and a return duct from the experimental ward back to the circulating fan. The dehumidified air from the gel unit mixes with the return air in a manifold on the suction line of the circulating fan. The latter picks up the mixed air (gel-treated air and return air) and forces it through the main cooler, then through the secondary filter and then up through the riser duct leading to the experimental ward. The riser enters the ward through the window sash about 8 ft. above the floor. The return duct passes through a lower window sash about 3 ft. from the floor.

Tap water is used in the main cooler. The discharge water from the main cooler feeds the after-cooler in the gel unit. The discharge water from the after-cooler goes directly to the sewer. The temperature of the tap water varied between 71 and 74 F. Cooling of the mixed air passing through the main cooler has been to within 1 or 2 F. of the cold water inlet temperature.

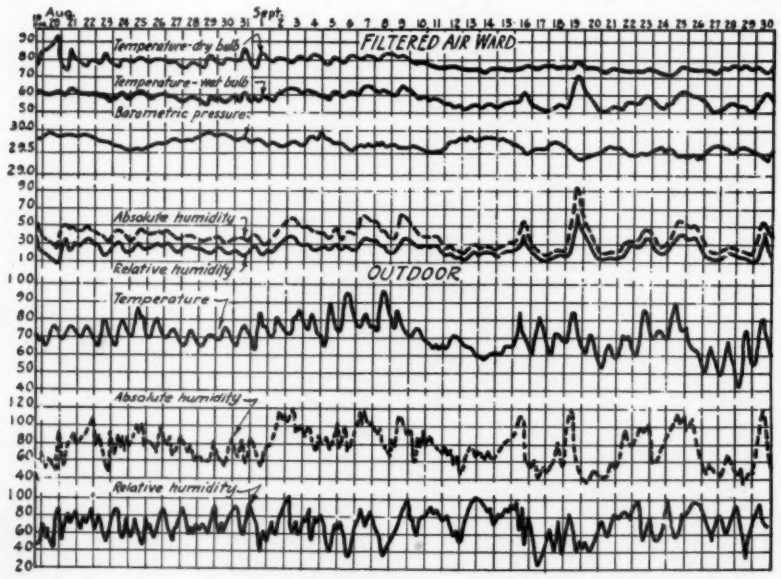


Figure 2
Temperature, absolute humidity, relative humidity, and barometric pressure in the air conditioned ward and out-of-doors

Special Precautions with Filter Installation

Filtration is accomplished in two stages. The primary filter is located just ahead of the gel unit and filters

the fresh air obtained from the ventilating duct before it enters the gel unit. The filter box contains two 20" x 20" fluted filters in the vertical position. Each filter has a filtering area of 20 sq.ft. The air velocity through the filters is 207 f.p.m. The filters are renewed every seven days.

Secondary filtration is accomplished by two 20" x 20" filters in the horizontal position. The air velocity through these filters is 285 ft. Special air tight doors are provided for accessibility to filter boxes.

Special precautions were taken in all construction work to make all joints as air tight as possible, because 100 per cent filtration of pollen was desired. Canvas connections were six ply and well shellacked. Duct joints were well soldered. All construction was made as rigidly as possible so as to eliminate noise.

Fresh air delivery to the gel units amounts to 1145 c.f.m. Conditioned air delivery to the ward amounts to 1405 c.f.m. With some allowance for leakage we can say that about 70 per cent of the conditioned air delivered to the ward is fresh air.

Tables 1 and 2 and Fig. 2 show daily observations during the conduct of the experiment.

The absorption of moisture from the air by the silica gel depends on the original content of moisture. The higher the original moisture the lower the per cent absorbed by the gel as a function of the original amount.

Absolute humidity content in grains per lb. of dry air of the fresh air to be treated	*Per cent of the absolute humidity removed by the silica gel*
60	72.5%
70	70.0
80	63.0
90	60.0
100	57.0

Our experimental ward was maintained under a slight pressure in excess of atmospheric so leakage around windows and doors is outward. This prevents infiltration of outside air containing pollen. The ward had an air capacity of 7260 cu.ft.

When 2200 cfm. were delivered the air changes per hour amounted to 18.2. With an air delivery of 1505 c.f.m., 12.4 air changes per hour were obtained.

Results of the Experiments

Twenty-five patients with pollen asthma were confined in the ward from 5 to 31 days during the 1933 pollen season. As in our previous observations, patients with mild asthma were relieved in twenty-four hours, while those with very severe asthma required from 2 to 18 days for complete relief. However, with the low relative humidity and relatively constant temperature *the degree of relief obtained was greater and more prompt* than in our previous experiments.

It was also observed that several pollen asthma patients, who were symptom free, developed attacks of asthma while confined in the air conditioned ward shortly after a severe thunderstorm on September 4, 1933. Unlike the attacks which were precipitated under similar conditions in 1932, and which came on within an hour of the onset of the storm and were of severe degree, the attacks following the storm in 1933 came on from 6 to 8 hours later and were of a milder degree. The disappearance of symptoms was also more rapid than was observed in 1932.

Conclusions

1. On the basis of our results this year on pollen asthmatics, which showed that complete relief was obtained in four days in 16 patients out of 22, we are led to conclude that the rapidity with which pollen asthmatics are relieved is greater under conditions of low humidity and relatively constant temperature in pollen-free atmosphere, than when the temperature and humidity are not controlled.

2. In a pollen-free atmosphere with the relative humidity ranging between 15 and 40 per cent and the temperatures ranging between 72 and 82 F., patients with pollen asthma had a delayed onset (6-8 hours) of symptoms in attacks precipitated by storms. This conclusion is based on a comparison with the time of onset (1 hour) of symptoms in the patients in our experimental ward in 1932.

It is our impression that the asthmatic attacks in the ward during storms were less severe and that the symptoms disappeared much more rapidly as compared to attacks precipitated during the experimental period of 1932.

3. Under our experimental conditions, a concentration of ozone considerably greater than occurs after a heavy electrical storm, showed no beneficial or detrimental effects.

4. Some other factor, or factors, outside of pollen, humidity, temperature, or the concentration of ozone must play a role in the precipitation of symptoms of asthma in pollen asthmatics. Barometric changes and ionization have not as yet been studied.

Karl F. Griffith Dies Suddenly

KARL F. GRIFFITH, vice-president and general counsel, Lone Star Gas Company, Dallas, Texas, was fatally injured December 19 in an automobile accident while on his way home from a trial rate case before the Texas Railroad Commission at Waco, involving rates of the Texas Cities Gas Company. Mr. Griffith was struck by a passing automobile while attempting to fix his own car along the roadside. He is survived by his widow, his mother, Mrs. Stella Griffith, of Ohio, and a sister, Mrs. H. D. Graessler, of Trona, California.

Mr. Griffith, who was 42 years of age, was born in Lancaster, Ohio. He attended Ohio State University and after his graduation entered the legal department of the Ohio Fuel Supply Company. He became associated with the Lone Star Gas Company in 1917. Mr. Griffith was chairman of the Rate Fundamentals Committee of the American Gas Association. He was held in high esteem by his many friends in the gas industry, especially for his notable work in connection with rates.

Board Elections

E. P. PREZZANO, vice-president of the Westchester Lighting Co., Mt. Vernon, N. Y., has been elected to the board of the Yonkers Electric Light & Power Co., and William L. Diehl, secretary of the Westchester Lighting and Yonkers Electric Light & Power Companies, to the board of the Bronx Gas & Electric Co.

Research is an organized method of trying to find out what you are going to do after you can't keep on doing what you are doing now.—C. F. Kettering

Industrial Gas Section Organizes for 1935 Program

J. F. Quinn

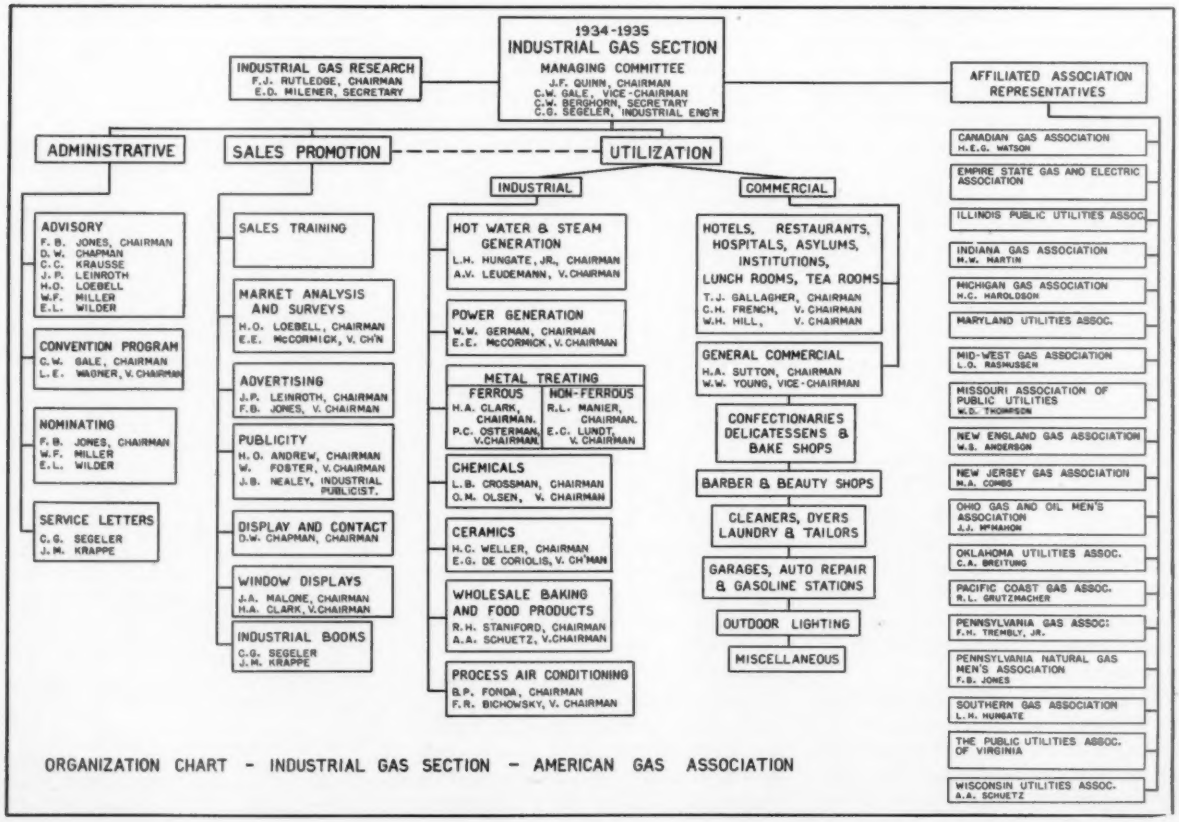
A PROGRAM of activities of the Association's Industrial Gas Section for 1935 was adopted at a meeting of the Section's managing committee held December 11 in Brooklyn. Twenty-four members were in attendance, representatives from Boston to Denver presenting views from East to West.

As indicated on the organization chart distributed by Chairman Joseph F. Quinn at the meeting, the activities of the Section are divided into three major divisions, administrative, sales promotion and utilization, the latter being again divided into industrial and commercial. Each committee in the Sales Promotion and Utilization groups is expected to collect utilization data, sales promotion material, competitive fuel information, and if necessary, to outline needs for research in their particular fields.

In accordance with past practice, instead of waiting for the year end for committee reports, the material which can be immediately disseminated will be sent to A. G. A. Headquarters for incorporation into service letters and other publicity material that can be distributed to the industry. The keynote of the year's program is to be modernization.

Chairman Quinn summarized the plans of the Market Analysis and Survey Committee, H. O. Loebell, chairman, by pointing out that the nucleus of the work of this committee had been undertaken some years ago by Industrial Gas Section Survey Committees, and that the work of 1935 could begin on this foundation and extend its activities especially through those fields that were potentially large heat users but were not yet saturated as far as gas burning appliances are concerned. A number of the members of the Managing Committee suggested specific fields for analysis, and the committee has been amply provided with ammunition with which to start its work.

A limited appropriation has been allotted for industrial advertising. It is intended to concentrate whatever advertising is undertaken on a limited number of industries rather than scatter the appropriation over a large field. As far as possible, national advertising will be tied in with local copy and with engineering articles. The work



ORGANIZATION CHART - INDUSTRIAL GAS SECTION - AMERICAN GAS ASSOCIATION

Managing Committee Meeting, Industrial Gas Section

of the Section's Advertising Committee will be closely correlated with that of the Publicity Committee, under the chairmanship of H. O. Andrew.

Following the report of the Advertising Committee, Mr. Quinn emphasized the importance of the *Industrial Gas Magazine* as a direct-mail tool for keeping industrial gas utilization before all industry. A plea was made for full use of this medium by all gas companies in order that through the support of added circulation it could be made a better publication in serving the cause of holding and increasing the industrial gas load.

National Gas Exhibits

One of the important functions of the Industrial Gas Section is to sponsor gas exhibits in the various national expositions. As in previous years, displays will be held at the National Metals Exposition, National Hotel Show, National Exposition of Power and Mechanical Engineering. Appropriations have been set aside to continue this work during the coming season.

Plans were considered for establishing a window display service covering industrial exhibits only. J. A. Malone, chairman, estimated that such a service, at a tentative cost of $20 a year for each subscription, would permit sending one mailing a month on an attractive, successful industrial window display. The effectiveness of industrial displays in New York, Brooklyn, Philadelphia and Detroit was stressed by representatives from these companies who are most enthusiastic on the results obtained from this form of display. It was hoped that other companies would be able to profit by a service of this kind.

The Metal Treating Committee, divided into two subcommittees, indicated that atmosphere control would be one of the major fields of study for the coming year. Specific reference was made to a number of new units available and these will also be given consideration by the committee. In fact, if sufficient interest develops, it may prove desirable to hold a symposium on the treatment of ferrous metals. H. A. Clark is chairman of this division. The non-ferrous group, R. L. Manier, chairman, reported that the subject of non-ferrous metal melting had been studied to great advantage in the past, so that, temporarily, additional work did not seem to be necessary in this field except perhaps on galvanizing problems. It was suggested, however, that differences in the heat treatment of non-ferrous metals, especially aluminum ageing and bright annealing, would provide a fertile field for studies for increased application of gas. The committee personnel will be chosen from localities where this type of work is being done.

Ceramic Work

Similarly, the Ceramics Committee, headed by H. C. Weller, reported that contact had been established with the American Ceramic Society and the United States Potters Association and both of these organizations have agreed to cooperate fully. A survey will be undertaken with reference to existing kilns and furnaces, covering both the processes and the fuels used, and outlining what future trends are likely to affect this industry. Since a great portion of the ceramic work is concentrated in eastern Ohio and western Pennsylvania and adjacent territory, it was expected that a very compact committee will be able to furnish much useful information during the coming year.

R. H. Staniford, chairman of the Wholesale Baking and Food Products Committee, reported that greatly increased activities on the part of manufacturers building oil baking ovens would prompt the committee to new efforts to contact all developments and to send out to the industry as a whole full information on the competitive situation. It was also recommended that a symposium in cooperation with the hotel and restaurant group be held as was done last year. The Hotel and Restaurant Committee supplemented Mr. Staniford's remarks by reporting that their activities for the coming year, under the leadership of T. J. Gallagher, would be directed principally towards spreading the story about modernization of gas in the commercial kitchen. It was also suggested that the Industrial Gas Section consider the advisability of having a speaker on hotel and restaurant subjects at the 1935 A. G. A. Convention.

Air Conditioning

The Process Air Conditioning Committee is a new development and consequently B. P. Fonda, chairman, could only outline a tentative program. He stated that equipment was now in use for industrial air conditioning in telephone exchanges, cable manufacturing plants, underground message delivery tubes, pharmaceutical and film manufacturing, chemical, radio laboratories, in the printing and lithographing field, for the conditioning of shoes and leather, and also in egg storage, cosmetic, hair dressing and cork manufacturing plants. Both solid and liquid absorbers were mentioned, and the committee expected to study the relative position of gas and other fuels in connection with these various processes.

Others who reported briefly that their committee organizations had been effected and that a program would shortly be adopted included, L. B. Crossman, chairman, Chemicals Committee; W. W. German, chairman, Power Generation Committee; L. H. Hungate, chairman, Hot Water and Steam Generation Committee; D. W. Chapman, chairman, Display and Contact Committee and H. A. Sutton, chairman, General Commercial Committee.

The Big Market for New Ranges

THAT a rich market exists for modern cooking ranges, and particularly a replacement market, is clearly indicated by the government's housing survey in 64 cities. This study reveals that, of the 2,627,288 homes visited, 696,848, or 26.4 per cent, use neither gas nor electricity for cooking; 1,828,487, or 69.6 per cent, use gas, while 101,953, or 4 per cent, use electricity for cooking.

The overwhelming dominance of gas stoves is no surprise. The gas range industry holds an enviable supremacy in the cooking appliance field. But there is every indication that this advantage will be hotly contested during the next few years by the young, aggressive and resourceful electrical industry. Shopping-center stores are in a peculiarly favorable position to profit by the competition between the two industries which is sure to take place soon. While the gas stove manufacturers and gas utilities are sitting pretty at present, there is very little apparent effort on their part to strengthen or even to hold their position.

At Stake: A Rich Market

The margin of superiority of the gas stove over the electric stove, in so far as cost, efficiency and ease of operation is concerned, is rapidly being shortened by extensive and intensive effort on the part of electrical manufactures to produce a unit whose initial cost is comparable to that of better gas ranges. Through co-operation of electric utility companies the burden of installation cost, which has proved an obstacle to stores and consumers, is being eliminated or alleviated and rates are being constantly lowered to make operation costs equable in certain localities. Efficiency of the two methods of cooking is about the same, both industries claiming the edge here. Electrical cookery is doubtless cleaner than gas.

The gas stove industry, or at least some of its leading members, is fully aware that their position as leaders will be vigorously assailed, says S. E. Little, vice-president in charge of sales of the American Stove Company:

"With such a large proportion of the market in its grasp; with such bright prospects for continually adding new users; with a tremendous investment to protect; with ample resources at hand, the continued apathy and semi-indifference of some gas utilities to new electrical competition is difficult to understand."

Who's to Blame?

Mr. Little is, perhaps, partly correct in blaming the gas utilities for the industry's vulnerability, but shopping-center store executives are in a position to know that the manufacturers themselves are at least partially to blame. Very little effort is made by manufacturers as a whole to sell the advantages of gas cookery to the public. This, after all, is at least partially a function of the manufacturer. Then, too, the gas stove people have been rather slow in the improvement of design of their product, with some very notable exceptions.

Most important, the point of contact which will eventually decide the issue—the large department, furniture or hardware store—has been, in most cases, underestimated and neglected.

The gas range industry's very criticism of the gas utilities indicates that these manufacturers, in common with members of other large home-ware industries, are not generally aware of the startling changes in distribution that have taken place in the last five years. They mistakenly look upon the gas utility as a potent factor in appliance merchandising. They erroneously regard the small specialty store as important, failing to recognize that the large departmentalized home furnishing store has gained supremacy over these and every other type of retail outlet of all home furnishings.

If these stores discover, in the future, that electric ranges are experiencing less and less consumer resistance; that profit margins are about the same, and that the glamour of automatic electric cookery offsets the many real advantages of gas cookery, they will begin to push electrics aggressively, aided by powerful industrial and utility advertising. In fact, they have already begun to do so.

There was a time when a housewife, having cooked with gas, had little thought of competitive fuels or appliances. Merchants made sales merely by carrying gas stoves on their floors. Merchants were content to wait until the old gas range had outlived its usefulness, secure in the knowledge that when it did break down, the housewife would come in to get a new one.

Times Have Changed

But new conditions exist today. Thousands upon thousands of housewives are thinking beyond the purchase of a new cooking appliance. They are considering modernization of the entire kitchen. This brings up many questions. Electricity is now widely used in many household appliances. Mrs. Housewife is being forcibly told in many diverse ways that she can also use electricity for cooking—and get better results.

Consequently, when the decision to purchase a new cooking appliance is made, many housewives no longer place an order for a gas range as a matter of course. First, they are investigating, comparing. And for many housewives, gas cooking is represented by the old obsolete gas ranges in their kitchens.

Stores know that there is a sufficient number of old-fashioned, incompletely equipped gas ranges in use to constitute a vulnerable point for the electric range attack.

A survey has shown that 68 per cent of the 15,000,000 or more gas ranges now on gas company mains were purchased prior to 1929. Of the thousands of gas ranges traded in during the recent Southern California drive, over 60 per cent were designated as "old junk" while the remaining 40 per cent were hardly any better.

No keen insight or detailed analysis is necessary to see that this is a situation which is of vital interest to every merchant.

Reprinted from "Retail Ledger," November, 1934.

Within the next two years, stores will be merchandising both gas and electric ranges. The effort he puts behind either will depend to a considerable extent upon the cooperation he is able to get from manufacturers in the way of consumer advertising and new, sensational selling features. It will depend also on the enthusiasm which the store salesmen are able to obtain from manufacturers' sales helps and from the product itself; ability to transmit that enthusiasm to his customer.

Natural Gas Men to Meet in Memphis

ARRANGEMENTS have been completed for holding a Spring meeting of the Natural Gas Department of the American Gas Association at the Hotel Peabody, Memphis, May 6 to 9. The last meeting of this kind to be held by the Natural Gas Department was in Tulsa in 1932.

The committee in charge of the program for the Memphis meeting will convene about the middle of January and select topics for discussion. These will embrace the latest developments in the production, transmission and selling of natural gas. Tentative plans favor a round table treatment of live subjects, with an allotment of twenty minutes to a subject, divided into a fifteen-minute period for the presentation of a subject and a five-minute discussion.

Meyer Nominated for President of A. I. E. E.

E. B. MEYER, vice-president, United Engineers and Constructors, has been nominated for president of the American Institute of Electrical Engineers. If elected, Mr. Meyer will assume office August 1, 1935.

McCorkindale, First Utility Executive to Receive McCarter Medal

Left to right, front row: William B. Smith, editor, Roanoke World-News; former Congressman James P. Woods; Mr. McCorkindale; Mr. Hoffman (behind flowers); Mayor Small; and other officials during the presentation of the McCarter Medal

IN recognition of his services in saving the life of a young woman who had been overcome by gas, W. J. McCorkindale, vice-president and general manager of the Roanoke Gas Light Company, recently was presented with a McCarter medal. Mr. McCorkindale is believed to be the first gas company executive to receive this honor, previous awards having been made to employees for acts of bravery in the field.

Presentation of the medal and certificate was made by Mayor Sydney F. Small before a large group of company employees and other invited guests. R. C. Hoffman, Jr., president of the Roanoke company, presided at the meeting and introduced Mayor Small and other speakers.

In presenting the medal Mayor Small termed it "a fine recognition and distinction that has come to this official," and explained that the requirements of the award are superior to those of the Carnegie medal. The city is fortunate, said the mayor, in the splendid spirit of cooperation and efficiency that exists among employees and officials of its public utilities.

Mr. Hoffman traced the history of the McCarter medal and emphasized the stimulus it has given to all utility employees to train themselves to meet emergencies such as accidental asphyxiation.

Short talks describing the work of the Roanoke First Aid and Life Saving crew were made by Julian S. Wise, captain, and W. P. Hunter, city manager.

Gas Sales Increase in 1934

THE gas industry in the United States in 1934 showed an improvement for the first time since 1930 registering an increase in customers, sales and revenue over the preceding year, according to Alexander Forward, managing director of the American Gas Association.

Manufactured and natural gas companies, supplying towns and cities with a population of 80,000,000, served a total of 15,700,000 customers. Of these, 10,000,000 were served by the manufactured gas industry and the remaining 5,700,000 were served by the natural gas industry. Sales of the manufactured gas industry gained 6.9 per cent over 1933, aggregating 363,000,000,000 cubic feet. Public utility sales of the natural gas industry, excluding carbon black and field use, amounted to 934,000,000,000 cubic feet, an increase of 14.1 per cent over 1933. Revenues of the industry totalled $698,000,000. Manufactured gas companies earned $382,000,000 and natural gas companies $316,000,000, a gain of 1.1 per cent and 4.6 per cent respectively.

Investment in the gas industry was approximately the same as for 1933. For the manufactured gas industry investment amounted to $2,500,000,000 and for the natural gas industry $2,300,000,000.

Gas range sales in 1934 showed remarkable increase. Approximately 1,000,000 gas ranges were sold in the year, representing a gain of about 280,000, or nearly 40 per cent over 1933. It is interesting to note that nearly 70 per cent of these sales consisted of relatively high priced ranges incorporating modern automatic features, such as oven heat control, etc.

Midwest Sales Council

THE next meeting of the Midwest Industrial Gas Sales Council will be held at the Palmer House in Chicago, Friday, January 17. The program for this meeting will include: actual sales experiences of members of the council; a resumé of the 1934 A. G. A. Convention, and the election of officers and appointment of committees for 1935.

H. V. Middleworth Dies

HENRY V. MIDDLEWORTH, superintendent of operations, transportation department, Consolidated Gas Company of New York, died suddenly on Sunday, December 9, following a heart attack.

Mr. Middleworth was employed by the Consolidated Gas Company for more than thirty-three years. He was active in automotive circles, and was a past president of the New York State Motor Truck Association, and a member of the Society of Automotive Engineers. He was also active in employee organizations of the Gas Company.

He is survived by his wife, two sons, and a daughter. He was born in 1871 in Hudson Falls, N. Y.

Putting the Brilliance on the New White House Dinner Set

By EUGENE D. MILENER
American Gas Association

AT the Assocation's recent convention in Atlantic City, L. S. Briggs, a distinguished ceramic engineer of Lenox Potteries, presented a paper before the Industrial Gas session entitled "Modernizing the Oldest Mechanical Art." At that time Mr. Briggs made the statement that the final determination of the success or failure of the new gas convected heat process was imminent and, in fact, would "be determined within the next thirty days." His words were more than borne out by subsequent events. Within those next thirty days the Lenox Pottery had been commissioned to design and create the first new White House dinner set since the administration of Woodrow Wilson.

Cooperative Research Kiln, Lenox Potteries. High temperature walking beams and convected gas heat firing processes were developed in connection with this apparatus

New Conception of Glost Firing

The story behind this signal success is an interesting one. It is the story of the fieldwork which has been conducted jointly by the Committee on Industrial Gas Research and the Lenox organization, with the object of applying gas heat to glost firing high-grade tableware and other ceramic products. An entirely new conception of glost firing was involved in this field research. Features that it was sought to attain included—(1) dependence on convected heat instead of on the time honored radiant heat, (2) drastic reduction of the time cycle, (3) considerable reduction in operating labor, (4) a new ratio of the total B.t.u.'s expended to the tons of ware produced, (5) a new peak in accurate distribution of heat to each piece of ware, due to the peculiar properties of convected heat, (6) a new peak in the percentage of ware perfectly fired, and (7) utilizing to the fullest advantage certain mechanical features of kiln construction and operation entirely new in the ceramic industry.

In his report to the convention, Mr. Briggs described the great number of steps that were taken to bring each of these features to a practical stage and also described the advanced gas kiln engineering and construction that had been developed. He explained the early failures and the later gradual elimination of each problem that stood in the way of glost firing high-grade volatile ware by the new convected gas heat process. At that time, Mr. Briggs was optimistic because the results from both the ceramic and the economic standpoints were within about 5% of those sought.

Performance Tests

Alterations to the research kiln were completed and it was again put into operation immediately after the convention. Its performance was carefully regulated and watched by officials of the Lenox Potteries, Public Service Electric & Gas Company and the American Gas Association Industrial Research Committee. The production of ware was subjected to the most severe tests the ceramic engineers could devise, and when dinner plates —the crux of tableware manufacture —were pronounced "practically perfect," success was assured.

Then came these questions: Should the glost firing of the new White House set be entrusted to a new process that had only a few days before been pronounced successful? Could the finish on these 1800 precious pieces be allowed to depend on the operation of a new fangled open kiln that uses convected gas heat instead of on kilns that use saggers and muffles that have been tried and found true since the days when the lad Omar Khayyam told of watching them being fired in the ancient potteries?

For weeks the best artists and artisans of the pottery had been busy with minute preparations. The finest clays had been selected, the "jiggers," "casters" and other machines had been thoroughly overhauled and a schedule had been carefully worked out that would insure the completion of each of the 1800 pieces, and their safe delivery in Washington before the first state dinner immediately after the opening of Congress. There was a feeling of expectation, even among those men who had made most of the famous sets that have been produced in this country. Here was an outstanding opportunity to uphold the

ideals of Walter Scott Lenox, the first to challenge successfully the firmly held belief that American potteries could not attain the peaks of quality and art so long held by European potters.

After nearly three years of research, testing, experimenting, and, of course, the inevitable discouragements, the new gas process had, for the first time, apparently met *all* of the exacting requirements hoped for. The new gas kiln had again been altered and was now in operation. The ceramists were examining every piece that came out of it, as a jeweler, with trained and critical eye, examines a diamond.

H. A. Brown, president of Lenox Incorporated had watched the convected gas firing process develop from the laboratory stage in Rutgers University. He had thrown open the doors of his pottery to the Research Committee and had given freely of his broad experience in overcoming one obstacle after the other in making the new gas process both technically and economically feasible. When the Research Committee authorized Surface Combustion Corporation to do the engineering and construction work in connection with this research project he had greatly assisted their engineers, not because they were inexperienced in scientifically applying heat, but because this was pioneer work in a new field, albeit in an old art.

The Supreme Test

The experts present felt that the new gas process was ready for its supreme test. They knew that every part in the research kiln had been checked as probably no other kiln had been checked before. When came the question of firing the White House set in the new gas kiln, each one held his breath. Would Mr. Brown's decision be "Yes" or "No"? Thousands of dollars were at stake, but also days and weeks still more precious could not be lost because artists who were later to put on the final gold and blue decorations cannot be hurried. The closely worked out schedule could, under no circumstances, be allowed to fail.

Mr. Brown nodded his head in assent and every man present felt a thrill that is hard to describe.

Within twenty-four hours to the split second, the first piece came out of the cooling end of the kiln; a cup covered with a glaze that had a luster scarcely ever seen before. No pieces of other famous sets ever before had been glazed in twenty-four hours. Thirty, forty, fifty and even sixty hours always had been the allotted time. Other pieces followed that first cup in rapid succession; saucers, large plates, small plates and bowls, and each was as beautiful as the one before—a perfectly matched set. The velvety luster of the glaze was perfect because a new way of assuring that long sought-for brilliance had been successfully put to work.

MEASURING ASSOCIATION VALUES

By DANA D. BARNUM
President, Boston Consolidated Gas Company

The first association in the gas industry was formed in Boston on February 2, 1871, and was named the New England Association of Gas Engineers. The original preamble read as follows:

"Whereas, the manufacture and supply of gas has become one of the largest economic interests of the country; and, whereas, it is most important to the manufacturers and to the public that the best processes known shall be employed in its manufacture and distribution, and whereas, it is most desirable to obtain the advantage of the experience of the gas engineers scattered throughout New England upon various problems presented for consideration; we, the undersigned, hereby agree to associate ourselves for the above-named purpose, ..."

During the past sixty-three years this Association has continued to function and grow each year, and today is a very important factor in the growth and stabilization of the industry in this section of the country. It has kept its activities within the legitimate and proper field that such organizations should cover and has continually demonstrated its usefulness.

It is comparatively easy to visualize the work of a sectional organization, and in doing so it helps to evaluate a national association.

The activities of the American Gas Association are so many and varied that it is difficult to state their relative value. Perhaps it would bring their value to our minds if we were to ask ourselves what we would miss, or how we would be handicapped if we did not have the following:

1. **Statistical data relating to operations, finance, legislation and technical subjects.**
2. **Research under the various divisions and committees.**
3. **Work of the laboratory and standardization of appliances.**
4. **Annual meeting and exhibition.**
5. **Education of gas company employees.**
6. **Cooperation with other industries such as architectural, building and plumbing.**
7. **Unified classification of accounting.**

These are activities that every company benefits by and there are many others that are invaluable to various companies. To realize the value of the Association it seems to me that the simplest way is to try to imagine the industry without the above work that is carried on continually year after year. The Association is primarily a medium of exchange for information and experience both by published reports and by personal contact. Any member of the industry who does not take advantage of the above is handicapping his company and himself.

R. G. Hunt Retires

ROBERT G. HUNT, vice-president of Byllesby Engineering and Management Corporation and Standard Gas and Electric Company, after thirty-nine years of service with the Byllesby organization and predecessor companies, resigned on December 1 to retire to private life.

In 1905 Mr. Hunt was appointed manager of San Diego Consolidated Gas and Electric Company—that company's first manager following its acquisition by H. M. Byllesby and Company. He was transferred to Chicago in 1906 and appointed assistant to Arthur S. Huey, vice-president in charge of operation, H. M. Byllesby and Company. Since 1923 he has been vice-president in charge of property acquisitions.

Industrial Window

By H. A. CLARK*
and
J. A. MALONE†

THE Detroit City Gas Company is continuing a program of industrial window displays which was referred to in the A. G. A. MONTHLY of May, 1934. When this series was started, it was felt that a certain beneficial effect would be produced on industrial customers and prospects, but one of the main reasons for going into this program was for the possible effect on the domestic consumer. It was felt that the impressiveness of displays of this nature, showing the selection and use of gas as a fuel by some of the nation's largest and most well-known manufacturers, would react favorably on customers in other than industrial classifications.

While this favorable reaction on the part of domestic customers was no doubt produced, it was rather surprising that, in Detroit, these industrial window displays obtained widespread interest from the industrial customers themselves. This was much more marked than had been anticipated. It had been expected that the industrial customers would be somewhat mildly interested in the displays and would cooperate to the extent of furnishing their products. Their unexpectedly active interest is probably due to the plan behind this window display program. Instead of trying to have a general window display for some particular branch of industry, without featuring any particular manufacturer, the Detroit City Gas Company laid out their window display work to show specifically the products of one particular manufacturer at a time, also stressing in the display the use of gas in the production of the articles referred to. The window displays were changed approximately each month, each succeeding one being devoted to a different manufacturer.

While the program normally called for but one industrial window in each month, due to the urgent request of manufacturers, two such windows were shown in May, 1934. One was devoted to the EverHot Heater Company and a photograph of this display is here shown. The product itself was displayed, also the various parts disassembled. A strip of photographs showed the interior of the manufacturer's plant. The display, of course, mentioned the use of gas in the manufacture of this equipment. A most attractive display during the same month was that of the Ward Baking Company. The photograph shows how strikingly the various baked products can be shown. Gas is mentioned as the fuel in the making of these products.

* Vice-Chairman of Committee on Industrial Window Displays.
† Chairman of Committee on Industrial Window Displays.

Displays in Detroit

Following these displays was one featuring Dodge cars, with particular reference to the coil spring which functions in this car in the Dodge "floating cushion" wheel suspension. There is a statement used in this display to the effect that every heating operation in connection with the manufacture of these coil springs is done with gas fuel.

The next industrial window display in this series was also devoted to the automotive industry. Chevrolet was the manufacturer in this case and the particular feature forming the basis of the display was "knee action." Here again, attention was called to the fact that gas was the fuel selected in the preparation of the springs for the "knee action" mechanism. There is a very substantial amount of gas fuel used by this manufacturer for the heat treating of the springs.

In September the industrial window space was devoted to the subject of peanut roasting and blanching. The product itself, Miller's peanuts, was shown both in bulk and in packages, well arranged in an unusual manner which drew a great deal of attention. The manufacturer was featured both in the packaged product and in the auxiliary signs in this display.

In October the display again featured metal products, in this case being devoted to the product of the National Twist Drill and Tool Company. The entire fuel requirements of this company are provided by gas which is used for forging, hardening and drawing work. The photograph shows a display of products arranged in a particularly attractive manner.

The November window display showed products of the Continental Die Casting Corporation. This company makes zinc and aluminum die castings, which have extended application in the automotive field. The window display was rather distinctive in that it showed a specialized view of a motor car with the principal die castings showing up in white against a dark background. The photograph also shows dies, actual castings and photographs of the manufacturer's plant. Gas is used as the fuel in the production of these die castings.

The general effect of these industrial window displays, while along slightly different lines from what was originally anticipated, has been so good that a continued program of such displays is contemplated. The industrial customers themselves appear to be keenly interested in having their products so displayed. The good will developed by this program and the opportunity for favorable contacts with large industrial users are factors which alone would warrant the continuance of this type of window display activity.

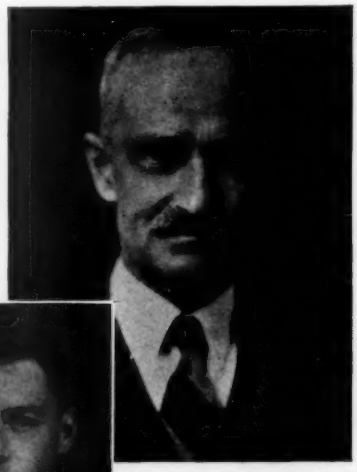
Michigan's Gas Engineering Fellowship and Its Influence on the Second Generation

Prof. White

By ALFRED H. WHITE

Professor of Chemical Engineering, University of Michigan

WHEN members of the Michigan Gas Association founded their fellowship in gas engineering at the University of Michigan thirty-four years ago for the purpose of arousing an interest in the gas industry among college students and also of promoting research work, they little thought that the influence of this fellowship would be shown in a second generation. Yet that is what has happened and at the present time there are two sons of former fellowship holders who are following their fathers' footsteps in the gas industry.



Left—The first holder of the Michigan Gas Association Fellowship in Gas Engineering and his son. Herman Russell, president of the Rochester Gas and Electric Co., and Edwin Russell, cadet engineer, Consolidated Gas Co. of New York

Right—The fourth holder of the Michigan Gas Association Fellowship in Gas Engineering and his son. Samuel Ball, district manager, Consumers' Power Co. of Bay City, and Willard Ball, a senior in the Cooperative Course in Gas Engineering at the University of Michigan

This gas engineering fellowship was founded by the Michigan Gas Association in 1900 and is believed to be the senior industrial fellowship now maintained in the United States in any branch of science or engineering. Although it was interrupted during the war, there were two holders of fellowships appointed for a few years, so that at present Alfred W. Fleer is the thirty-fourth holder of the fellowship in the thirty-fourth year of its existence. One of these fellowship holders is dead, one has retired from active business after more than 25 years in the gas industry, and one never made any direct use of his professional experience. The other thirty-one are all in contact with engineering projects and twenty-five of them have had major contacts with the gas industry. At the present time one is editor of a gas journal, one is a college professor, eleven are in industrial positions where their knowledge of gas may be of direct importance, and seventeen are employed in the manufacture and distribution of natural or artificial gas.

It is worth while to consider the progress of the early holders of the fellowship and the first six have been chosen for this review partly to emphasize the changes which have taken place in the gas industry since they started their work.

Research has always been a part of the program of this fellowship and in the first three years the holders of the fellowship worked upon a problem which was then an important one to the gas industry, but which is now so nearly obsolete that it may seem strange that it was ever considered to be of prime importance. In 1900 gas was still used primarily as an illuminant and was sold on a candle power basis. Electricity had become a formidable competitor in this field and the gas industry was hoping to recover lost ground by the use of the Welsbach mantle. Gas was also being introduced in cooking stoves and it was recognized that for that purpose it should be sold on a B.t.u. rather than on a candle power basis. There was much objection to this change in the method of testing gas and one of the queries was as to whether the value of gas in the Welsbach mantle was due to its illuminating value or to its heating value.

This was the subject studied for three years by the first three holders of the fellowship. Herman Russell showed that the value of gas in a Welsbach mantle was largely proportional to its heating value and not at all in proportion to its candle power. Alva Traver carried the work further and measured the temperature of the mantle which he showed was always colder than the flame surrounding it. This contradicted the theory held by the noted English chemist, Dr. V. B. Lewes, who had taught that the high illumination of the Welsbach mantle was due to catalytic oxidation on its surface, which raised its temperature above that of the surrounding flame. Max Mueller, in continuing this research work, showed that the Welsbach mantle slowly lost its illuminating power due to volatilization of its cerium oxide.

* * *

The Michigan Gas Association then asked that the holders of the fellowship investigate the subject of naphthalene, whose erratic behavior caused many gas men to hold firmly to the belief that it was a manifestation of a personal and exceptionally malicious devil who gave his attention to the gas industry. Samuel Ball determined the curve of vapor pressures of naphthalene and showed that that substance did not present any unusual phenomena in the presence of foreign gases.

David Clary and Joel Barnes by many analyses in various gas plants showed that the naphthalene vapor in crude coal gas was mainly removed by solution in the tar particles, and that if much light tar was allowed to go forward into the ammonia scrubbers the solvent action of the ammonia on the phenols of the tar caused the undissolved tar to become supersaturated and to return naphthalene to the gas. This investigation was editorially commended by the London *Gas World* as "about the high water mark of knowledge in relation to the treatment of gas for naphthalene in bulk."

These first six holders of the fellowship all started to work in the gas industry at the conclusion of their fellowship work and five of the six remained with it for many years. Herman Russell, the first holder of the fellowship, became associated with the Rochester, New York, Gas Company early in his career and has remained with that company, rising to his present position of president. He is also a director of the American Gas Association. His son, Edwin, graduated from the course in chemical engineering at the University of Michigan in 1933. He had a high scholarship record, was Captain of the track team and a student of great influence. He is now a cadet engineer with the Consolidated Gas Company of New York. The family resemblance between father and son is quite noticeable, as the pictures show.

Alva Frederick Traver was associated for many years in an operating capacity with the Cities Service Company. In 1929 he became associated with the American Commonwealth Power Company and is now with the Community Gas and Power Company as a director and one of its administrative heads.

Max E. Mueller was employed by various public utilities for thirty years and has now retired from active business because of poor health.

Samuel Ball, the fourth holder of the fellowship, has remained in Michigan ever since he started with the Jackson Gas Company. He has been district manager of the Consumers Power Company with headquarters at Bay City, Michigan, for many years. He was president of the Michigan Gas Association in 1919 and has also been president of the Rotary Club of Bay City and of the local Y.M.C.A. His son, Willard Ball, will graduate from the course in chemical engineering at the University of Michigan next February after having completed the cooperative course in gas engineering. During his undergraduate career as part of the cooperative program he has had ten months of practical experience with The Peoples Gas Light and Coke Company of Chicago.

David H. Clary commenced his practical work with the Western Gas Construction Company, then went as works superintendent with the Minneapolis Gas Light Company and later became chemical engineer of the Pittsburgh Coal Company, directing distribution of coal in the northwestern district. He is now in business for himself as a consulting chemical engineer in Duluth.

Joel M. Barnes is the only one of the first six of the fellowship holders who did not spend many years in the gas industry. After one year in a gas works he transferred into production engineering and has been for many years head of his own firm, Barnes Textile Service, with headquarters in Boston.

A catalyst has been defined as something which promotes a chemical reaction without being itself used up so that it can theoretically, if given enough time, catalyze an infinite number of individual molecules. The Gas Engineering Fellowship maintained by the Michigan Gas Association has stimulated not only those who have received direct benefits from it, but also others who have been successful in the gas industry. The Fellowship is apparently as vigorous as ever and it is hoped it may continue as a catalyst with unlessened energy.

McCarter Awards

WILLIAM B. SIBBITTS, of The Philadelphia Gas Works Company, Philadelphia, Pa., was singularly honored for live saving at a staff meeting on December 11. He was presented with a McCarter medal and certificate for the effective use of the Schafer prone pressure method of resuscitation, which resulted in the recovery of an elderly woman who had been overcome by gas.

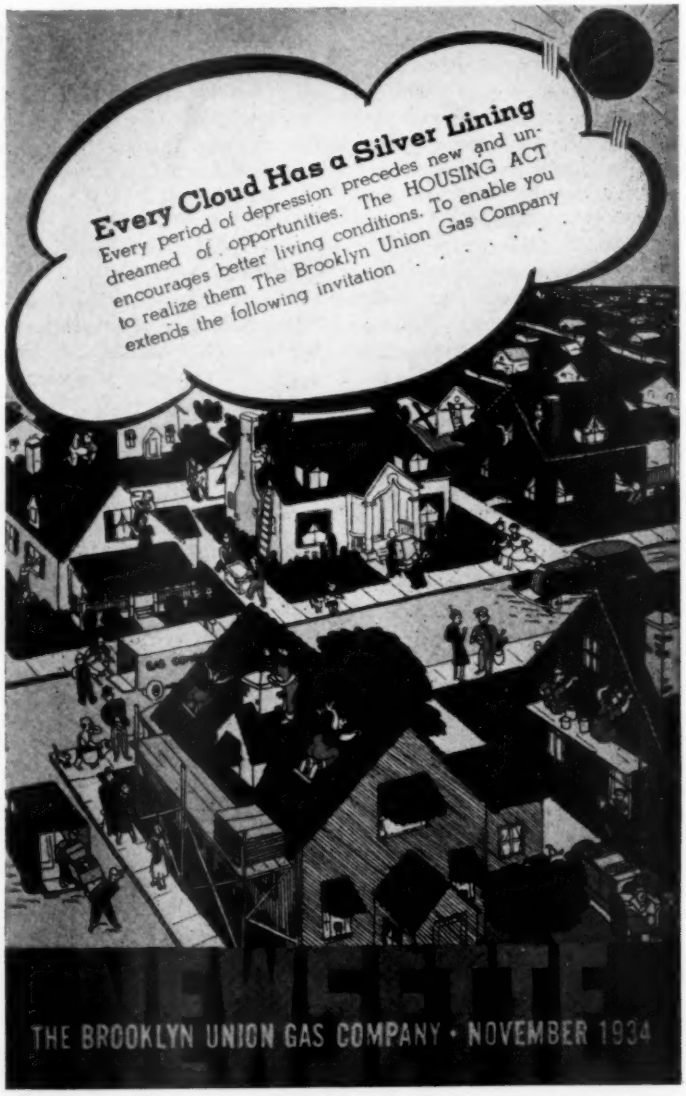
Mr. Sibbitts was introduced at the staff meeting by P. T. Dashiell, vice-president of the company. C. N. Lauer, president, presented the medal and certificate and congratulated Mr. Sibbitts for his courage and efficiency.

Glen D. Barritt and Harry W. Reeves, employees of the Peoples Power Company, Moline, Illinois, recently received McCarter awards in recognition of their achievement in saving a human life. They were presented with the awards at a meeting of company employees in the firm's auditorium in Moline. B. T. Williamson, engineer of the gas department, made the presentation speeches.

These two men were credited with saving the life of A. L. Burnett who had been overcome by gas. Mr. Barritt, who received both the McCarter medal and certificate, is foreman of the gas fitter's shop in Rock Island, and Mr. Reeves, who received the certificate for assistance in life saving, is assistant superintendent of the gas distribution department.

The McCarter awards are made possible by Thomas N. McCarter, president of the Public Service Company of New Jersey.

Tying-in with National Housing Act



Cover in full color of the November "Newsette," The Brooklyn Union Gas Company, which ties in with the National Housing Act by concise, convincing statements of the economy, as well as the comfort of gas in home modernization.

Since gas appliances are essential to comfort and economy in other parts of the house than the kitchen, the Kitchen Planning Division of The Brooklyn Union Gas Company has been changed to the Home Modernization Division, for while a modern woman wants her kitchen to be as efficient and attractive as possible, she is interested also in getting out of the kitchen and doing other things.

This Home Modernization Division believes that while gas appliance advertising sells the idea that modern automatic equipment cuts down the amount of work necessary in the kitchen, it should go a step further and show how modern automatic gas equipment affects the leisure hours. "P. U. A. A. Bulletin."

Book Review

"Essential Features of Comfort Air Conditioning in Non-Technical Language," by O. W. Ott.

The author selects as chapter subjects five functions of complete summer or winter air conditioning, the heating phase, the cooling phase, humidity, cleaning, and air motion. While the subject matter is written in non-technical language, the author does not avoid the introduction of technical information when he considers it necessary. The technical data is incomplete in spots but helps in developing a picture of the general aspects of air conditioning.

In the chapter on the heating phase of air conditioning the author disposes of the unvented room heater as a successful air conditioning device but does not devote much attention to the central house heating systems which are essential parts of a winter air conditioning system. The remaining chapters on cooling, humidity, cleaning and air motion give a very clear conception of the fundamentals involved. The booklet should be useful to employees of gas and electric companies.

Price—35¢ per single copy. 44 pages. Publisher, O. W. Ott, consulting mechanical engineer, Los Angeles, California.

—J. M. K.

Oklahoma Company Organizes Home Service Department

THE successful operation of home service departments at its Oklahoma City and Tulsa Districts, has led the Oklahoma Natural Gas Company to organize a complete department in all its districts. Miss Mildred R. Clark, who had been the director at Oklahoma City since September, 1931, has recently been promoted to supervisor of home service and a very thorough program has been laid out. Miss Clark is a graduate of the University of Oklahoma.

At Tulsa, Miss Emma Mae Deichman, a graduate of Oklahoma A. and M. College at Stillwater, is the director of home service for the entire district, with Miss Rosemary Locke, graduate of Iowa State College at Ames, Iowa, as assistant director.

Miss Doris McKnight is director at the Enid district office, having recently graduated from Iowa State College. A very attractive home service room has just been installed at the Muskogee District office, with Miss Nina Provost, a graduate of the University of Oklahoma, in charge.

At Oklahoma City District office, Miss Harryette Hunter was appointed as director, with Miss Racheal Bonebrake as assistant. Miss Hunter graduated from Oklahoma College for Women and Miss Bonebrake from Oklahoma University. All are graduates of home economics of their respective colleges.

Affiliated Association Activities

Mid-West Gas Association

THE Thirtieth Annual Convention of the Mid-West Gas Association will be held April 15, 16 and 17, 1935, at Omaha, Nebraska, headquarters to be at the Hotel Fontenelle, according to an announcement of Secretary-Treasurer R. B. Searing. Vice-President F. H. Brooks of the Northern Natural Gas Company of Omaha has been appointed chairman of the committee in charge of the program.

New England Gas Association

THE annual meeting of the Association will be held at the Hotel Statler, Boston, on Thursday and Friday, February 14 and 15. The directors' dinner will take place on the evening of Wednesday, February 13. The program calls for morning and afternoon sessions on both Thursday and Friday.

The following Program Committee has been announced: F. M. Goodwin, of Boston, chairman, R. H. Knowlton, of Hartford, F. L. Ball, of Boston, C. H. Cummings, of Boston, David Daly, of Pawtucket, R. L. Fletcher, of Providence, R. J. Rutherford, of Cambridge, H. R. Sterrett, of New Haven, J. A. Weiser, of Newport, and John West, of Fall River.

At a meeting of the Association's directors it was decided to hold a business conference rather than a convention and to eliminate the so-called "banquet." This same policy has been followed at the last two annual meetings. It was further decided that the first evening of the annual meeting would be left free of engagements to allow for impromptu gatherings.

The results of several contests now being held will be announced at the first session of the meeting. Among these are:

(a) A sales contest among the member gas companies for the best results per domestic meter during 1934 in the sale of ranges, refrigerators, automatic water heaters, tank water heaters and for the best showing domestic output;

(b) A contest in each division as to the paper delivered at any of its meetings during the year which is adjudged to be the most valuable to the New England gas industry, and the paper which is adjudged to be worthy of honorable mention;

(c) An "Idea Contest" in which a first prize of $35, a second prize of $20, and three additional prizes of $5 each will be awarded to the five authors of the 2,000-word papers which are adjudged to be the most valuable to the New England gas industry;

(d) A contest among the members of the industrial division, in which prizes of $15, $10, and $5 will be awarded to those persons who have submitted the largest number of "Gas Utilization Reports" during the year for release to members.

New Jersey Gas Association

THE New Jersey Gas Association held the last of a series of five regional meetings December 4 in Hackensack. Other meetings were held November 14, in Millville; November 15, in Trenton; November 20, in Newark, and November 21, in Allenhurst.

Similar programs were presented at each meeting. These included the presentation of papers on the subjects of "Customer Relations," "Gas Distribution" and other topics of timely interest.

E. J. Menerey, president of the Peoples Gas Company, Glassboro, is president of the Association; Herbert E. Cliff, of the Public Service Electric and Gas Company, first vice-president; W. S. Potter, of the Elizabethtown Consolidated Gas Company, second vice-president, and George B. Webber, of the Public Service Electric and Gas Company, secretary and treasurer.

Oklahoma Utilities Association

THE annual reorganization meeting of the General Committee for the Southwestern Gas Measurement Short Course was held in the Oklahoma Utilities Association offices in Oklahoma City, November 19, with D. C. Williams of Ponca City, general chairman, in charge.

New members of the committee for the 1935 short course are: B. P. Stockwell of the Corporation Commission, Oklahoma City; William F. Lowe of Tulsa, secretary of Natural Gasoline Association of America; J. H. Satterwhite, Tulsa, American Meter Company; Earl Kightlinger, Shreveport, La., Arkansas Natural Gas Corporation. John H. Baxter of the Inland Gas Company, Ashland, Kentucky, who was identified actively with the short course during the first two years of its history, was added to the ex-officio membership comprised of past general chairmen.

Chairmen of subcommittees are the following: Banquet, Entertainment and Arrangements, W. H. Carson, Norman; Program, R. D. Turner, Tulsa; Exhibits, G. W. McCollough, Bartlesville; Registration, E. F. McKay, Oklahoma City; Study of Practical Methods, Ray Rountree, Houston, Texas, and Publications, Max Watson, Amarillo, Texas.

The General Committee will hold a meeting in January to decide dates for the 1935 course, to be held at the University of Oklahoma, Norman.

Pacific Coast Gas Association

THE Pacific Coast Gas Association has announced the following committee appointments in its Technical Section, of which A. R. Bailey is chairman: J. F. Sauer, Pacific Gas and Electric Company, chairman, Production Committee; Subcommittees under Natural Gas Transmission Committee, P. E. Beckman, chair-

Convention Calendar

JANUARY

17 **Mid-West Industrial Gas Sales Conference**
Palmer House, Chicago, Ill.

28-30 **American Society of Heating and Ventilating Engineers**
Buffalo, N. Y.

FEBRUARY

14-15 **New England Gas Association**
Hotel Statler, Boston, Mass.

APRIL

8-10 **A. G. A. Distribution Conference**
Cleveland Hotel, Cleveland, Ohio

15-17 **Mid-West Gas Association**
Hotel Fontenelle, Omaha, Nebr.

22-26 **American Chemical Society**
Hotel Pennsylvania, New York. N. Y.

MAY

6- 9 **Natural Gas Department**
Hotel Peabody, Memphis, Tenn.

7- 9 **Pennsylvania Gas Association**
Lodge at Skytop Club, Skytop, Pa.

Wk. May 13 **National Fire Protection Association**
Biltmore Hotel, Atlanta, Ga.

13-14 **A. G. A. Joint Committee Conference of the Production and Chemical Committees**
Hotel New Yorker, New York, N. Y.

JUNE

10-11 **Canadian Gas Association**
Quebec, Canada

24-29 **American Society for Testing Materials**
Book-Cadillac Hotel, Detroit, Mich.

OCTOBER

14-18 **American Gas Association**
Atlantic City, N. J.

man; A. B. Allyne, Southern Counties Gas Company, chairman, Pipe Protection Committee; Grove Lawrence, Southern California Gas Company, chairman, Compressor Plant Committee; F. A. Hough, Southern Counties Gas Company, chairman, Internal Corrosion and Dehydration Committee; R. M. Stewart, Pacific Gas and Electric Company, chairman, Large Volume Measurement Committee.

Subcommittees under Distribution Committee, N. L. Hoff, chairman; C. A. Renz, Los Angeles Gas and Electric Corporation, chairman, Safe Gas Distribution Practice Committee; E. G. Campbell, Pacific Gas and Electric Company, chairman, Distribution Valve and Governor Inspection Committee; Guy Corfield, Los Angeles Gas and Electric Corporation, chairman, Effect of Humidity on Meter Proof Committee; M. T. Burton, Southern California Gas Company, chairman, Optimum Odorant Concentration Committee.

Subcommittee under Utilization Committee, Technical Section, H. W. Geyer, chairman; R. C. Terradell, Los Angeles Gas and Electric Corporation, chairman, Field Equipment and Training of Service Men Committee.

Wisconsin Utilities Association

ENGINEERS and operators of gas and electric companies met in joint and separate convention sessions, Nov. 22 and 23 at Madison, under the auspices of the Technical and Operating Section of the Wisconsin Utilities Association. The registration totalled 226.

L. P. Ziebell, Wisconsin Public Service Corporation, Green Bay, was elected chairman of the Gas Division and T. J. Danehy, Wisconsin Fuel and Light Company, Manitowoc, vice-chairman.

Professor O. L. Kowalke reported on the combustion researches conducted at the University of Wisconsin, and S. B. Sherman, Racine, described the proposed new standard meter report which the public service commission intends to incorporate in the new gas service rules that have been ordered in effect with the beginning of the new year.

Commenting on the gas business in Wisconsin, H. B. Hummell said the industry was overcoming difficulties by technical advancements, by improvements in the thermal efficiency of gas ranges, and by more intensive individual and cooperative dealer sales efforts applied to all manner of gas utilization equipment. These efforts must be intensively continued, he urged.

Frank Burns, Milwaukee, spoke on Diversion and Unaccounted for Gas, and A. C. Davey, Oshkosh, recommended that gas companies launch an intensive sales attack to meet competition.

J. G. Schellenberg, Chicago, said that the gas range manufacturers in developing the new style top burners and broiling ovens, plus quality construction, are doing all in their power to lighten the gas utility's battle with competitive fuels. O. C. Roehl, Green Bay, described the Wisconsin Public Service Corporation's cooperative gas and electric selling program, and G. V. Rork, president of the Wisconsin Utilities Association, said Wisconsin utilities do not fear any inroads through fair equitable competition, nor do they have any reason to fear adequate yardsticks.

A. F. Tegen, Appleton, urged company managements to afford their employees every opportunity to become true representatives of companies in their contacts with customers.

Alexander Forward, managing director of the American Gas Association, quoted from reports made by European gas engineers at the recent International Gas Union held in Switzerland to the effect that the gas industry in the United States is leading the world in scientific achievement.

: *Additions to the Family* :

NOVEMBER 15—DECEMBER 15, 1934

GAS COMPANIES

Delegates

Minnesota Northern Natural Gas Company, Omaha, Nebr. . . . . F. H. Brooks

MANUFACTURER COMPANIES

Aladdin Heating Corporation, Oakland, Calif. . . . . A. W. Bergevin
Norge Corporation, Detroit, Mich. . . . . H. H. Whittingham

INDIVIDUAL MEMBERS

Avis, F. D. . . . . Consumers Power Company, Jackson, Mich.
Ball, Samuel . . . . . Consumers Power Company, Bay City, Mich.
Boman, W. C. . . . . Consumers Power Company, Alpena, Mich.
Bond, P. S. . . . . Consumers Power Company, Charlotte, Mich.
Brower, G. M. . . . . Consumers Power Company, Hastings, Mich.
Campbell, B. G. . . . . Consumers Power Company, Pontiac, Mich.
Challenger, Barclay R. . . . . Washington Gas Light Company, Washington, D. C.
Clark, L. W. . . . . Consumers Power Company, Mt. Clemens, Mich.
Cobb, W. G. . . . . Consumers Power Company, Owosso, Mich.
Cope, F. P. . . . . Consumers Power Company, Kalamazoo, Mich.
Davis, H. H. . . . . Consumers Power Company, Jackson, Mich.
Deal, E. C. . . . . Scranton-Spring Brook W. S. Co., Scranton, Pa.
Deal, E. C., Jr. . . . . Scranton-Spring Brook W. S. Co., Scranton, Pa.
Eppes, B. S. . . . . Consumers Power Company, Battle Creek, Mich.
Eyl, W. C. . . . . 1851 S. Limestone Street, Lexington, Ky.
Fossett, Margaret P. . . . . Boston Consolidated Gas Co., Boston, Mass.
Fulton, Edwin . . . . . Greenwood Gas & Fuel Company, Greenwood, S. C.
Gauger, Alfred W. . . . . The Pennsylvania State College, State College, Pa.
Holt, C. S. . . . . Consumers Power Company, Sault Ste. Marie, Mich.
Jones, Albert E. . . . . New Bedford Gas & Edison Lt. Co., New Bedford, Mass.
Lane, William J. . . . . Westchester Lighting Company, Yonkers, N. Y.
Leggitt, S. H. . . . . Consumers Power Company, Marshall, Mich.
Ludwig, Geo. E. . . . . Grand Rapids Gas Light Company, Grand Rapids, Mich.
Maltby, Richard . . . . . Consumers Power Company, Ionia, Mich.
Moran, E. A. . . . . Scranton-Spring Brook W. S. Co., Scranton, Pa.
Neilson, George H., Jr. . . . . Equitable Gas Company, Pittsburgh, Pa.
Palmer, R. B. . . . . Consumers Power Company, Saginaw, Mich.
Pett, Howard . . . . . Consumers Power Company, Lansing, Mich.
Pigott, Harlan H. . . . . Equitable Gas Company, Pittsburgh, Pa.
Polk, Tom C. . . . . Public Service Company of Indiana, Indianapolis, Ind.
Price, L. L. . . . . Consumers Power Company, Plymouth, Mich.
Putnam, A. A. . . . . Northern Berkshire Gas Company, North Adams, Mass.
Read, William George . . . . Corporation Council for the City of New York, New York, N. Y.
Ruggles, Clyde O. . . . . Harvard Graduate School, Boston, Mass.
Stephens, H. H. . . . . Consumers Power Company, Alma, Mich.
Sweeney, Arthur A. . . . . New England Pr. Engrg. & Ser. Corp., Boston, Mass.
Tracht, Lloyd V. . . . . United Gas Public Service Company, Houston, Texas
Woodfill, J. R. . . . . Public Service Company of Colorado, Denver, Colo.
Yaggy, Edward Esher, Jr. . . . . Public Service Electric & Gas Company, Newark, N. Y.

CANADA

Brewer, Casimir R. . . . . The Consumers Gas Company of Toronto, Toronto 2, Ont., Can.
Smith, Hugh G. . . . . The Consumers Gas Company of Toronto, Toronto 2, Ont., Can.

NETHERLAND

Meyer, Gerard . . . . . The Netherland Gas Association, The Hague, Netherland

ACCOUNTING SECTION

Avoiding Peak Loads in the Commercial Department*

By H. H. HESSLER

The Philadelphia Gas Works Company, Philadelphia, Pa.

DO you remember the commotion and annoyance formerly caused by the transfer of route book sheets? Or perhaps you are still annoyed with the periodical wholesale transfers of such sheets? If you are, you will no doubt be interested in a way to overcome this undesirable condition.

In The Philadelphia Gas Works Company it has been the custom for years to transfer route book sheets at intervals, rather than to do all the transferring at one given time, but it was not until recently when the customers' accounting activities were completely centralized that a systematic method and schedule were worked out which eliminates peak loads and at the same time reduces to a minimum the confusion and errors so prevalent in the past during a transfer.

We are not saying that the system now in effect is the "last word" or that experience with it will not develop some additional short cuts or improvements that may be made, but it is very much superior to the former method and so far has worked out splendidly. It is with these qualifications that we are presenting the details of the method with the hope that possibly, at least in part if not in its entirety, it may be the means of helping someone else solve this admittedly important but usually troublesome job.

Our plan is built on the basis that we are constantly transferring route sheets. The basic requisites for staggering the work are as follows:

1. Route Book Sheets starting with different months.
2. Equalizing as nearly as possible the number of sheets beginning with any one month.
3. Equalizing as nearly as possible the number of sheets beginning in a cycle of three years. (This would, of course, vary with the type sheet used, whether it is designed for one, two or three years.)

We have 1,421 route books caring for 471,870 meters which will be transferred over a period of three years beginning September, 1933, and ending June, 1936, as shown on the following page.

It will be noticed that there are no transfers in July and August as this is the period of maximum vacations, also that June is relatively light. During these months, the force ordinarily used on transfer work is used for vacation relief obviating the employment of that number at least of additional employees for vacation relief.

Advantages

Aside from the elimination of peak loads, there are many advantages to this plan.

* Contribution of the Office Management Committee.

DATE SET	SIZE	METER NO.	DATE REMOVED	LOCATION	REMARKS	CREDIT INFORM.	RATE	DATE ON	CUSTOMER'S NAME	DATE OFF
									2	
									3	
									4	
									5	
									6	

PREV. YEAR CONS.	YEAR	INDEX	CONS. HUNDRED C. F.	UNPAID BALANCE GAS	MDSE. DUE	YEAR	INDEX	CONS. HUNDRED C. F.	UNPAID BALANCE GAS	MDSE. DUE	YEAR	INDEX	CONS. HUNDRED C. F.	UNPAID BALANCE GAS	MDSE DUE
	SEPT.					SEPT.					SEPT.				
	AUG.					AUG.					AUG.				
	JULY					JULY					JULY				
	JUNE					JUNE					JUNE				
	MAY					MAY					MAY				
	APR.					APR.					APR.				
	MAR.					MAR.					MAR.				
	FEB.					FEB.					FEB.				
	JAN.					JAN.					JAN.				
	DEC.					DEC.					DEC.				
	NOV.					NOV.					NOV.				
	OCT.					OCT.					OCT.				
TRANS. INDEX													DOMESTIC		

Copy of Domestic Route Book sheet. Other Domestic Route Book sheets are the same as above except for the different starting months

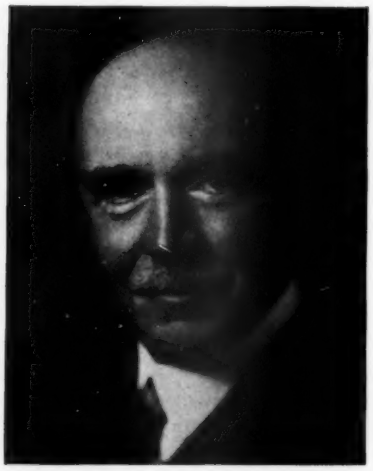
Month	Books 33-34	Books 34-35	Books 35-36	Meters 33-34	Meters 34-35	Meters 35-36
September	43	43	36	14,916	12,933	14,177
October	48	55	47	16,587	16,225	15,944
November	46	56	56	16,039	17,891	18,353
December	54	52	55	17,676	15,726	18,447
January	50	49	53	15,558	15,349	17,731
February	52	37	51	17,724	13,935	17,232
March	51	38	51	16,572	14,296	17,313
April	54	42	50	15,580	15,363	17,690
May	46	46	54	13,510	16,907	18,375
June	32	42	32	10,457	13,244	10,120
TOTAL	476	460 (1,421)	485	154,619	151,869 (471,870)	165,382

1. A permanent group can be set up to handle this operation, with a consequent increase in accuracy and efficiency. (We have one clerk continuously employed on this and another who spends a varying amount of his time at it.)
2. If mistakes occur in transferring indexes there is no doubt about whose fault it is and this tends to reduce the number made.
3. Because fewer errors are made, high bill inquiries are reduced.

While this program can be carried out under decentralized operation, in our case we found the following tendencies:

1. Although sheets with different starting months were in use, transfers were such an annoyance to everybody that there was a tendency to make three or four "bites" out of a ten "bite" job. Temporary help was employed to do this work and consequently errors frequently occurred.
2. Sheets were not used for their full length of life in order that the transfer of several months' work could be accomplished at one time.
3. Because of reasons 1 and 2, orders were not posted promptly in the route books which naturally disturbed customer relations.
4. No one office had enough transferring to do to justify assigning this work to a particular person, and as this was an extra job it was generally considered a "stepchild."

"Father" of Accounting Section Retires



Henry M. Brundage

HENRY M. BRUNDAGE, who retired as vice-president of the Consolidated Gas Company of New York on Tuesday, December 11, was the guest of honor on Thursday, December 6, at a dinner at the University Club given by sixty of his associates. George B. Cortelyou, president of the company, presided.

The day Mr. Brundage selected to start his retirement also was the day on which he completed forty years of continuous service with the Consolidated Gas Company.

Among the speakers at the dinner were Mr. Brundage's first "boss" in the gas company, W. Greeley Hoyt, now president of the Standard Gas Light Company. Frank W. Smith, president of the New York Edison Company, and other officials of the companies in the Consolidated System also spoke. Mr. Brundage was presented with a pair of binoculars.

Mr. Brundage has a wide acquaintanceship in utility circles, having been identified with national and state utility organizations for many years. He served as treasurer of the American Gas Association from 1920 to 1926, and as president of the Empire State Gas and Electric Association in 1926 and 1927. One of his major contributions was his work on a uniform classification of accounts for the utility industry.

Mr. Brundage has been called the "father" of the American Gas Association's Accounting Section, and has been the head of many of its important committees. He also was the organizer and first president of the Society of Gas and Electric Accountants, a local organization.

Mr. Brundage considers the gas business his real life work. It was on December 11, 1894 that he first went to work in the general office of The Standard Gas Light Company, then located at 71 Broadway.

In 1901 Mr. Brundage was transferred to The United Electric Light and Power Company and was transferred two years later to the Consolidated Gas Company as chief clerk of the Accounting Department. He subsequently served as controller, assistant secretary, secretary, and in October, 1924, was elected a vice-president, the position he now holds. All matters pertaining to accounting, auditing, insurance, taxation, and related activities have come under Mr. Brundage's jurisdiction.

Gas Measurement Course Proceedings

IT is evident from an examination of the excellent papers and reports which make up the Proceedings of the tenth annual Southwestern Gas Measurement Short Course why this course has scored a success each year since its inauguration in 1924.

Conducted by the College of Engineering, University of Oklahoma, it is sponsored by the Oklahoma Utilities Association, the Natural Gasoline Association, the Oklahoma Corporation Commission and the Natural Gas Department of the American Gas Association.

Following are a few of the papers, chosen at random, which are included in these Proceedings: "Positive Displacement Gas Meters" by Allen D. MacLean, "Fundamental Principles of Regulation" by J. C. Diehl, "Fundamentals of Orifice Flow Measurement" by L. K. Spink and J. B. McMahon, "Calculation of Orifice Coefficients" by M. K. Watson, "Report of Subcommittee on Practical Meter and Regulator Stations" by R. M. Scofield and "Report of Subcommittee on Recording Thermometers" by R. L. Rountree.

The Proceedings should, in a measure, prove as beneficial to the reader as the classes were to the hundreds of students, engineers and various gas and meter men who attended. The price is $1.50 and the publication is available at the University of Oklahoma, Norman, Okla.

Recent Visitors to A. G. A. Headquarters

L. B. Crossman, Boston Consolidated Gas Company, Boston, Mass.
W. G. Rudd, The Peoples Gas Light & Coke Company, Chicago, Ill.
D. D. Barnum, Boston Consolidated Gas Company, Boston, Mass.
Earl Roberts, Detroit-Michigan Stove Company, Detroit, Mich.
H. M. Brundage, Jr., Washington Gas Light Company, Washington, D. C.
H. C. Cooper, Hope Natural Gas Company, Pittsburgh, Pa.
George Nash, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.
C. H. Light, The Peoples Gas Light & Coke Company, Chicago, Ill.
F. B. Jones, Equitable Gas Company, Pittsburgh, Pa.
T. J. Gallagher, The Peoples Gas Light & Coke Company, Chicago, Ill.
Arthur Apmann, Derby Gas and Electric Company, Derby, Conn.
C. W. Gale, Public Service Company of Colorado, Denver, Colo.

COMMERCIAL SECTION

F. M. ROSENKRANS, Chairman J. W. WEST, Jr., Secretary C. E. BENNETT, Vice-Chairman

The Trial Rental Plan for Developing Automatic Gas Water Heating Load

By DAVIS M. DEBARD
Stone & Webster Service Corp.

WHEN we began the serious attack upon the problem of gas residential load building our attention was focused on two major load building items, space heating and automatic water heating.

Space heating, particularly in the natural gas properties, can best be provided through radiant fires, an appliance which including the installation cost would not average the customer more than $20 per unit. Such an appliance can be sold easily by the organizing of a House Warmers Campaign, similar to the successful campaigns conducted in Atlanta during the last two years. The monthly installments of 25¢ down and $1.00 per month complete the payments well within the usual periods given by utilities on installment accounts, and are small enough to be within the reach of the majority of customers using gas.

The radiant fire has public acceptance. The job remaining is mass selling. More and more gas companies are successfully conducting "House Warmers" or "Chill Chaser" radiant fire campaigns.

Obstacles to Sales

The automatic water heater offers a different sales problem than the radiant fire. In the first place a great many customers either used or had a friend who owned an automatic heater years ago. The gas rates were much higher then than now. The heaters were less efficient. The monthly operating charges for the automatic water heater were considered expensive by the customer.

An automatic water heater installed, sold on monthly installment bases, would be approximately $5 cash, $3 per month. The installment payment added to the gas bill would make a total monthly bill, in many cases, more than the customer was willing to pay.

During the last few years we have made substantial rate reductions for water heating.

To demonstrate that water could be heated economically by gas we decided to offer either a 20 or a 30 gallon automatic gas water heater on a trial rental plan at $1 down and $1 per month installed, the customer having the right to turn the heater back at will. The customer was given the following options—to purchase for cash at any time at a discount of 10% on the balance remaining after rental was deducted, or to continue to pay rental until total sales value and carrying charges were paid, when the heater became the property of the customer. A dealer and plumber participation plan was worked out for each property, which met with marked success.

This rental plan differs from the English and European plans of hiring appliances, of which I made a study this summer in the following respect:

Results of Rental Plan

The English customer never becomes the owner of the appliance, while the trial rental plan, when established, in reality is a sales plan with payments extended over 5 to 6 years, the customer having no equity until the last payment is made, at which time the appliance becomes his property.

In the early Fall of 1933, as a first step in this work, we secured the cooperation of one of the largest gas water heater manufacturers who so thoroughly believed our idea of rental was right that he offered to finance for the operating company water heaters over a considerable period of time that we might give the plan a thorough trial.

Our plan has now been in operation a full year and we not only have been surprised but pleased with results accomplished. The operating companies have placed on their lines 3 to 7 times as many automatic heaters during the last twelve months as compared with the previous twelve months, and the percentage of returns have been far less than they were the previous year on 24-month installment sales.

I do not want to bore you with figures, but the following is of interest.

From September 1, 1932 to September 1, 1933, nine operating gas companies in nine different states sold for cash and on installment plans 2897 automatic heaters. Returns from that year's sales have been 517, or 17% of sales. The same nine companies, during twelve months from September 1, 1933 to September 1, 1934, put out 9255 automatic heaters on the trial rental plan (a small portion were sold for cash) and have taken back for all causes 590, or 6%. We do not believe this figure, over a two year period will exceed 10%. All those heaters which have been taken back are thoroughly cleaned and re-rented.

Our customers have been rendered a service which they appreciate, judging by their acceptance of the plan.

I spent two months during the past summer in England and on the Continent contacting gas and electric utilities, studying load building plans with particular reference to rentals. I found in England that the gas companies have been renting (they call it hire) appliances during the past fifty years, and I was unable to find a single company who did not think well of the plan.

Great Britain has 1349 gas companies—about three quarters are privately operated, one quarter municipally operated. They have 10,328,000 total gas meters (8,000,000 of which are estimated to be residential). Total homes in Great Britain, 11,000,000; gas home saturation, 73%; electric home saturation only 33%. They have 6,068,000 prepayment, or slot meters. This is due to quarterly billing of accounts; most people prefer to pre-pay or pay monthly. Today the companies have appliances on straight rental which they have purchased from manufacturers and capitalized as follows:

Gas stoves	6,483,000
Radiant fires	2,038,000
Water heaters and miscellaneous	1,975,000
Total appliances rented	10,496,000

Rental of gas ranges would average 40¢ per month, and other appliances in proportion.

Depreciation

The managers are frank to say that the small rental charged does not completely cover repairs and depreciation, based on 7 to 10 years, but the combined income from rental and increased gas sale gives a most satisfactory return. Their reasoning is as follows:

"Our investment in plant and mains has been made. Our pipe lines cover the territory. The income of the majority of our families is low, estimated to average $50 to $60 per month. Such families can afford to pay monthly charges for gas and small rental charges, but cannot afford capital expenditure for appliance. The majority of our investment has been made right up to the customer's door. Why not make it possible with small additional capital in-

Paper presented before Commercial Section, A. G. A. Convention, Atlantic City, N. J., October 30, 1934.

vestment on our part to provide devices for the customer by which he can use our service from which we derive our income?"

The electric companies rent house wiring and all types of appliances. Ninety-five per cent of all major electrical appliances are on rental. The electric companies only have 3,600,000 home customers, or 33% saturation, compared with 8,000,000 gas home customers, or 73% saturation. Approximately two thirds of the electric companies are municipally owned, one third privately owned.

European Experience

I found the rental plan was being used extensively in Great Britain, Holland, Germany, Switzerland and France. In every instance, with one exception, I found the rental plan has proved of great value. The one instance was a gas company in Holland which had rented in 1932, through its dealers, 18,000 water heaters. Due to lack of vents, credit checks, high monthly rental charges, etc., 10,000 were returned during 1933. I could not resist saying to the sales manager that I was surprised his returns had not been even greater. Plans were corrected and revised in the latter part of 1933 and heaters are now going out at the rate of 300 per month.

One interesting fact is noteworthy. The electric company in the same city, during the last five years, has been renting off-peak electric water heaters. They now have 30,000 installed, and their curve of rentals has steadily gone upward while the gas company's rental curve looks like the contour of the Swiss Alps.

The electric company's organization checks every installation before and after it is installed and follows complaints promptly. The gas company did not exercise the same care, with disastrous results.

In conclusion let me say that it is difficult to compare practices in Europe with those in America due to the habits and customs of the people. Plans that have proven to be profitable load builders in Europe should be carefully considered before we say they will not work in America.

We too have several hundreds of dollars investment per residential customer in pipe lines and plant.

We too want to make appliances available so greater comfort and convenience will accrue to our customers.

We know if this can be done much idle investment will become active, upon which a return can be earned.

We know the installation of an automatic water heater gives customer satisfaction and an increased load.

We have demonstrated that the trial rental plan greatly increases the number of heaters installed per year.

I believe a way to render a real service to your customers and build a profitable load on your gas companies' lines is by establishing a trial rental plan for promoting automatic gas water heating.

An old saying is—"The Proof of the Pudding Is in the Eating." You'll never know what you can do with this type of load building campaign until you try.

THREE "R" SALES PROGRAM FOR THE GAS INDUSTRY

(Continued from page 5)

Second: Every gas customer who has discontinued the use of gas for whatever purpose should be contacted and advised regarding the cost of gas to do the cooking, water heating or house heating job which he formerly did with gas but is now carrying on with a competitive fuel. As long as these customers remain in ignorance of what they can do with gas in modern up-to-date appliances just so long will they be an anchor against our progress.

Third: Every effort should be made to replace existing inefficient, obsolete gas equipment and appliances with modern up-to-date gas equipment and gas appliances. In any event, our existing gas users should be given the facts regarding what modern gas appliances will do in comparison with the old obsolete type. This policy means a lessened revenue, but unless we see that our customers have modern economical appliances our competitors will do so for us.

Fourth: Existing equipment and appliances should be checked to see that they are properly functioning, that they have the correct amount of gas, that burners are cleaned and properly adjusted, that they are located in a manner to give the lowest operating cost, that the customer is fully advised as to the change which he can make to improve the operating efficiency and service from his existing appliances.

Fifth: That gas equipment and appliances should be made available on terms and conditions competitive with that of the other fuel industries selling in our gas areas.

The Three R's In the Domestic Field

In addition to the above suggestions every employee, salesman and as many dealers that will do so should take the course in "Tell Them About Gas Cooking" prepared by the American Gas Association. Every gas company should sell and advertise ranges completely insulated and equipped with heat controls and automatic lighting as a minimum requirement, and floors should carry a fully automatic gas range with the clock, and our salesmen should be instructed to talk the clock control even though the customer is not urged to the point where he buys one.

A special effort should be made to get the dealers to handle modern efficient gas ranges and to cooperate with the gas company on at least one major range activity per year. Furthermore, in those places where kitchen heating is a problem every gas company should undertake the promotion of kitchen heating ranges, burners, etc.

Gas Refrigeration

The problem here is primarily a competitive one with the electric refrigerator—sales promotion. Special effort should be made to obtain dealer outlets for gas refrigerators. Since the introduction of the new air cooled refrigerator and with the Electrolux refrigerator available with kerosene burners, a dealer now has an appliance which can be sold to all types of customers, namely, those on gas company mains as well as those off gas company mains.

The gas refrigerator is not only an important load builder developing some 18,000 to 25,000 cu.ft. of gas load per year, but is an important weapon of defense in holding the gas cooking load. In many instances the electric rates and our own gas rates are such that if a customer has electric lights and an electric refrigerator, she can add the electric range and cook cheaper than she can by gas.

Domestic Heating Field

We have before us a threefold problem in the domestic heating field which again can be termed the Three "R" Program.

First: Recover lost customers. (a) This can best be done by selling the new control features available for gas which eliminate Cold 70. (b) By selling healthful heat—modern air conditioning equipment. This will largely eliminate the cost comparison, since the service is not comparable. (c) By pointing out saving possible through use of "heat saving devices" insulation, whether stripping, storm windows, etc.

Second: Retain present customers. (a) Special effort should be made to correct present defects occasioned by faulty control equipment. (b) Customers should be urged to install heat saving devices, and in any event given cost for same and estimated saving which can be made. (c) Every customer should be given a cost comparison between oil and gas—all factors included. (Unless this is done, the oil man will stress the fuel saving and ignore the other factors, such as pilots, electricity, servicing, interest, depreciation.) (d) Present customers should be advised of the costs of heating water by means of oil in the heating boiler as determined by tests at M. I. T. (e) See that they understand the advantages of air conditioning equipment and that they have estimates on the cost of same. Of course, every effort should be made to sell them on installing air conditioning, if not in its entirety, at least in part.

Third: Replace competitive fuel with gas. This requires a modification of our past selling policies. (a) All equipment we offer for sale should eliminate Cold 70 and thereby enable salesmen to talk of a new service in heating. (b) All estimates for gas heating should be based on the use of heat saving devices, at least to the extent that the total cost for "gas equipment and heat saving devices" is equal to the cost of competitive heating equipment. (c) Sell air conditioning, which really gives us a talking feature over our competitors. This applies particularly to the large homes where we have the hardest job of justifying the use of gas, unless we render more than just a warm comfortable home without work or worry and supply in addition a healthful atmosphere within the homes.

Our experience has shown that with a proper gas rate and with an adequate and properly trained sales personnel the heating load will proceed to develop at a rapid rate. There is no reason we can see why any of our customers should buy oil boilers and oil burners in preference to gas, except that we have not given them all the facts. Hence, the responsibility for results or lack of results is ours.

Water Heating Field

The Three "R" Program is particularly applicable to our water heating field, since (at least it is our experience) this field has been the hardest hit during the past three years and is most vulnerable to attack. While the problems confronting us in the water heating field and recommendations to meet these problems have been covered in some detail by the writer in a number of articles during the past 18 months and more recently by Mr. Rutherford of the New England Gas & Electric Association, the water heating market is so important that some repetition is justified. I would like to emphasize the need to assure ourselves on the relative cost of heating water by gas, coal, oil and electricity—through studying the tests made by M. I. T. (these tests are obtainable through A. G. A. Headquarters) and, most important, by making your own local tests. We are convinced we can supply hot water more economically by gas than by any other means in the majority of our own gas properties, and our advertising so states in no uncertain terms.

We also believe it highly important to select one of the most efficient heaters to sell. There are some heaters now available which will give a 24-hour efficiency on a 50 gal. day draw of over 60%. Having selected one of these efficient heaters to sell we should endeavor to get present water heating customers having inefficient heaters to discard this equipment and use one of the efficient types. At least point out to them how much they can save through buying a modern efficient gas water heater. Failing in replacing the inefficient heater, every effort should be made to reduce the waste of gas through improving on the present installation. Perhaps the thermostat is set too high, or a tempering tank can be added—or perhaps the hot water lines are ¾ or 1" and by replacing with ⅜" copper tubing a saving in waste of hot water can be made, reducing the gas bill.

Present tank heater customers should be encouraged to install automatic heaters, since our competitors will talk about the care-free service obtainable with their product. The new low input conversion heaters offer an excellent opportunity to convert these tank heaters into automatically controlled water heaters. The service and operating cost is surprisingly satisfactory. Some companies may be surprised that bills of tank heater customers are not increased where the low input conversion heater is installed, and as a result will feel it is not worth while to sell them. Such an attitude, however, is because unless our customers have modern automatically controlled water heaters they will be easy prey for our competitors.

We should set up a real program of education among our own employees regarding the true facts of heating water by gas and competitive fuels. We should get these same facts over to dealers and to the public through bold and vigorous advertising. The water heating market from standpoint of cost of service, first cost of equipment and quality of service belongs to the gas industry. If we do not capture it we have no one to blame but ourselves.

We should make our terms attractive on water heaters. In fact the most successful results have been obtained through rental plans, or on what actually amounts to a rental plan—payments extending over 36 to 60 months. Our own results with rental plans has proven the merits of this method to our satisfaction. Experience has shown that a high percentage of rentals are converted into sale during the first year. A low monthly payment or rental plan gives the customer an opportunity to prove to his own satisfaction (without making a heavy investment) that gas water heating is economical and satisfactory.

Commercial Field

In spite of the severe competition in the commercial field, the baking and cooking load has shown a steady increase over the last two or three years, and we believe this is due largely to the fact that our commercial gas department has been concentrating on this load with special emphasis on training of personnel and on adequate servicing of existing appliances.

Our commercial field presents a Three "R" Program, as does the domestic field. Present equipment, where obsolete, should be replaced with modern equipment, or improved through servicing and additional features. I wish to emphasize one load building possibility in the commercial field which is generally neglected—commercial heating. One large group through the depression years was able to materially offset their loss in the domestic heating field by selling commercial heating. They could only have done so by showing that gas was more economical.

Service

In view of the rigid economies which have been made and are still necessary to be made on all operating expenses, it may seem to be presumptuous to recommend improving and enlarging on the servicing of customers' appliances. The only thing that can be said in defense of such a recommendation is that it is necessary to improve and extend the servicing of customers' appliances if we wish to retain and enlarge our gas sales. There is, however, ample evidence to justify an increase in servicing expense because of the new revenue added. The A. G. A. has recently issued a servicing manual on gas ranges and gas water heaters. Every service man and dealer or plumber installing gas ranges and gas water heaters should have one of these. Servicing of gas appliances is vital to the gas industry. We should find some method to give more service than we have in the past. Only by doing so can we hold our own and go ahead with greater sales.

I am convinced the gas industry has the fuel and the equipment which is capable of meeting competition from coal, oil or electricity. The troubles of the gas industry are not due so much to outside competition, but rather from those within the industry. Based on information at my command regarding comparative costs of gas and other fuels for various operations, whether it be cooking, water heating, space heating or commercial cooking, there is really no valid excuse from the operating cost or equipment cost standpoint for any fuel replacing gas, nor for gas not going ahead and replacing other fuels. The only reason gas has been replaced, and the only reason why gas does not go ahead at a faster rate is because we have not been willing to spend the time and money on shouting the virtues of gas as we have on, say, electricity. Hence, our problem is an internal one. It is one of constant employee, salesman and dealer education, and of enlarged promotional plans to advise the public of the facts and financing terms so that the public can satisfy the desire to own a gas water heater, refrigerator, house heating burners, etc. With our own people convinced we have a right to the fuel requirements of our customers now supplied by others, and with a determination to see that our customers have the facts, and by faithfully carrying out a Three "R" Program, I am confident the gas industry will witness a growth not dreamed possible. The results are up to us.

Gas Cooking Advertisements Available on Loan

ASSOCIATION Headquarters has collected a number of effective gas range and gas cooking advertisements in binders for loan to companies which are faced with a strong competitive situation. Included in the lot are the excellent series used by the Providence Gas Company, Detroit City Gas Company and Hartford Gas Company.

The purpose of this service is to make available to advertising men and sales managers samples of some of the best current newspaper advertising sponsored by gas companies to protect their domestic cooking load. It is hoped that a study of the advertisements will suggest new copy themes, illustration ideas and other points that will prove helpful in stressing the superiority of cooking by gas.

There is no charge for this service. The advertisements will be forwarded on loan for ten days, requests being filled in the order of their arrival at Headquarters. Kindly communicate with Charles W. Person, Director of Publicity and Advertising, Association Headquarters, New York, N. Y.

HOME SERVICE COMMITTEE

MARGARET NEVINS, Chairman — JESSIE McQUEEN, Secretary

Home Service Facts and Figures

Elizabeth Sweeney

A QUESTIONNAIRE prepared by a subcommittee of the Home Service Committee was submitted to all home service departments listed with the American Gas Association in the Spring of 1934. In 1930 a similar questionnaire was circulated and a comparison of results shows a considerable increase in the scope of home service over the four-year period. To both questionnaires, there was a response from about 30% of the home service departments listed with the Association, but this percentage includes the majority of the larger companies and, therefore, gives a fairly complete cross-section of home service work in the gas industry. The results are:

	1930	*1934*
Number of lectures	3,000	3,354
Number of people reached	194,930	288,227
Number of classes	6,986	7,220
Number of people reached	511,059	696,051
Number of home calls	176,830	499,024
Number of visitors at offices	67,750	313,336
Number reached on sales floor	114,645	239,145

Elizabeth Sweeney of the Empire Gas & Electric Co., Geneva, N. Y., who as chairman of this subcommittee, compiled the results of the questionnaire, draws some conclusions as follows:

1. There exists no uniformity as to home service personnel employed, in comparison to the size of the company, meters served and work attempted.

2. In general, the company official supervising home service work is the new business manager or merchandise manager, indicating a definite tie-in of home service work with the sales department.

3. The aims of home service are almost always reported similarly, being directed toward building good public relations; building sales of gas and of gas appliances; accomplishing these aims through customer and employee education in the use of our product.

4. It would seem from the replies that about 90% of the companies are using home service in home call work. In many instances only one appliance, such as ranges, received routine follow-up calls.

5. Frequently home service calls are made only upon request or complaint. In comparatively few cases do appliances other than ranges or refrigerators receive a follow-up instruction call. This conclusion may be incorrect since so many companies reported only the total number of home contacts rather than showing just what appliances were being followed up. "New Customer Calls" were reported by but few companies. In view of the general professed aim of home service as something of a public relations division, this might appear inconsistent.

6. Demonstrations of one type or another are a part of home service work with about 75% of the companies. This seems interesting as it rates demonstrations second to home calls in importance and effort expended. I think this may prove to be a development since the last questionnaire was compiled four years ago. It rather definitely explodes any belief that the major effort of home service is "teaching cooking" and is fine evidence of the place and part home service is being given in the promotional work of our industry.

7. Home service assistance in employee educational work is reported by half the companies. This is a satisfying trend.

8. Radio work in the larger cities seems very well organized.

9. Perhaps the newest, or at least the most popular new development, is the creation of kitchen planning divisions of home service. More companies report the inauguration of this work in 1934 than any other development.

10. More than 50% of the companies extend cooperation to dealers and in nearly every case home service has a part in this. It was disappointing that so many did not have available, actual figures as to the extent of this participation by home service. From the information which was reported, one felt that we are extending much more dealer assistance than the figures will indicate.

11. The diversity of work which is being handled by home service departments is gratifying proof of our need and of our ability to truly serve both our companies and the home makers of the world.

12. It seems quite evident that though we may be fine missionaries, we are pretty poor business men. There was a very general lack of statistical information as applied to the detailed operation of our departments. In many, many cases, only "total" figures were available on a given activity, and too many times even totals were lacking, and the answer would be, "No record kept on this activity." And yet, even from limited information given, one was so often convinced that a very complete home service job was being done—but the figures are lacking to prove it. I feel very strongly that we fail to do ourselves justice. Many directors, in submitting incomplete answers, intimated their intention of revising their record-keeping methods. It is to be hoped that this will result for the best interests of our work.

New Home Service Chairman

Margaret Nevins

MISS MARGARET NEVINS, home service director of The Syracuse Lighting Company, Inc., Syracuse, N. Y., has been appointed chairman of the Home Service Committee, according to an announcement by F. M. Rosenkrans, chairman of the Commercial Section.

Miss Nevins is head of the home service department of The Syracuse Company and also directs the home service work in the Central Division of The Niagara Hudson System. This group of companies has a varied program of work under way including a plan of lecture demonstrations incorporating special talks on appliances.

Home service activities operate as a function of the sales department in most companies and one of the projects to be stressed in the committee work this year will be that of organizing home service groups in various sections of the country as a part of the present sales conferences.

A. S. M. E. Appoints National Secretary

C. E. DAVIES, since 1931 executive secretary of the American Society of Mechanical Engineers, has been appointed national secretary of the Society. He succeeds Dr. Calvin W. Rice, whose death last October terminated twenty-seven years of active service as national secretary.

INDUSTRIAL GAS SECTION

J. F. QUINN, Chairman C. W. BERGHORN, Secretary C. W. GALE, Vice-Chairman

Gas Exhibit at Power Show Stresses Industrial Modernization

Three views of the gas industry's exhibit at the National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York City

By A. L. PALMER

The Brooklyn Union Gas Company

There was also a display of reference books dealing with various industrial applications and resulting from the gas industry's research. These books gave evidence of the printed display on one side wall of the booth which stated: "A national program of continuous gas research has provided the industrialist with new tools for the more efficient application of heat . . . results of such research are now available in printed form."

Opposite this on the other side wall of the booth was a large printed display emphasizing gas service. It read: "Even the finest equipment requires A-1 service . . . a unique feature of gas fuel is the rendering by gas companies of regular inspection and ready service at all times . . . one of the reasons why gas is preferred in industry."

The long center exhibit on the side of the booth opposite the entrance gave evidence of the research and service which gas has given to industry. In five wall panels it depicted recent advances in modern gas fuel usage by means of greatly enlarged photographs. Through the use of Robophone these examples were discussed

MODERNIZATION in industry through the efficiency and general adaptability of gas in industrial processes was the theme of the gas industry's exhibit at the 11th National Exposition of Power and Mechanical Engineering, held from December 3 to 8 in Grand Central Palace, New York City.

The gas exhibit was sponsored by the American Gas Association in cooperation with the following four New York gas companies: Brooklyn Borough Gas Company, The Brooklyn Union Gas Company, Consolidated Gas Company of N. Y. and New York and Richmond Gas Company.

The exhibit featured recent developments in gas fired industrial appliances, resulting from the fundamental research done by the gas industry, and the results of service given industry by the gas companies of the nation. Exhibits of burners, torches, forges, furnaces and other pieces of equipment for furnishing heat emphasized the advantages of gas in industrial processes.

through recordings, giving the impression of the panels actually speaking of their contribution to industrial progress.

The first of these panels illustrated the advance in process air conditioning for summer use. Its application is advantageous where humidity needs to be controlled during the summertime as in the lithographic, tobacco, textile and a host of other industries.

The second panel was on diffusion flame combustion which provides scale free steel in forging for the ferrous metal industry.

The third panel showed controlled atmosphere furnaces in which the atmosphere of the furnace is controlled while the furnace is at working temperatures. These furnaces are especially adapted for use in bright annealing work in both the ferrous and non-ferrous metals industries.

In the fourth panel was a picture of a muffle-less kiln, as used by Lenox, Inc., of Trenton, N. J. In these kilns are fired glost chinaware of the best quality in direct fired atmosphere using walking beam furnaces, 60 feet long, with a pre-heat soaking and cooling zone. The entire heating and cooling cycle covers a period of 24 hours.

The final panel depicted several phases of immersion heating, covering the heating of liquids and the melting of solids. These immersion coils are combustion chambers in which gas fuel is burned and are used in chemical, stereotyping, linotyping and other low melting white metal applications.

The exhibit included an impressive array of gas burners, designed to meet the diversified needs of industry. Torches which use gas instead of the more expensive acetylene were shown, as were a number of forges, furnaces and other heating equipment for low, medium and high temperature work.

One display emphasized the advantages of gas in processes which require that temperature be maintained at a constant level. Several gas burners were equipped with thermostatic controls, which were set to maintain a temperature of 400°, 600°, or 800° F. How close the burners came to maintaining the temperature for which they were set could be observed by watching the dial of a pyrometer.

There was shown also a new electrotype plate drying oven heated by a small, external direct fired air heater which also used the principle of recirculation. Attention was attracted by the single valve control for high temperature oven furnaces.

An electrotype furnace with immersion coils heated by gas with induced draft, thermostatically controlled, was on display. Instruments attached showed the close control of the metal temperature and low flue gas temperatures, demonstrating high efficiency.

How the Natural Gas Course Is Conducted

SOME interest has been expressed concerning the method of handling the home study course on natural gas now being conducted by the University of Kansas. This work was undertaken at the invitation of the American Gas Association.

The primary purpose is to give each individual student the kind of attention that will let him get the most benefit from the work. What this will be depends on the student. If he is well prepared and has had experience it will be little because he can study things out for himself, perhaps with an occasional suggestion of outside reading. But if he is not well prepared, or lacks experience, he will need added explanations and suggestions. The general plan for handling the work makes this possible.

When an application arrives at the office of the Extension Division, a record is made covering all details given concerning the position occupied by the student, his preparation, and his library facilities. The applications are numbered serially. The records are filed alphabetically and numerical cross-reference is made. By means of this filing system it is possible to locate all available information by either the name or the number of the student.

A record card, carrying the information concerning the student, with his number, is sent to the instructor, who is also thus able to locate each student both numerically and alphabetically. This card sent to the instructor and a similar one in the office of the Extension Division are provided with spaces for recording the date of receipt of each set of papers sent in by the student, the grade given, and the date of return of the papers.

When a recitation paper is received the date is stamped on it and a record of the receipt of the assignment made on the student's card. The paper then goes to the instructor, who records the date of receipt by him, examines the paper and grades it in accordance with his idea of what can be expected, writes out his criticism and suggestions for the student, records the date of return and sends the paper back to the office of the Extension Division. Here the grade is recorded and the paper is returned to the student.

Some of the papers received show thorough study, possibly backed by a very good preliminary understanding of the subject based on experience. In such cases there is practically nothing to do but give the paper a high grade and send it back. In other cases there may be evidence of too much haste in preparing the answers. When this happens the student is advised to study the assignment again with the idea of picking up all available information. Or there may be failure to understand some part of an assignment, in which case an effort is made to give an explanation.

In order to give as much personal attention as possible, some students have been asked by letter to outline their personal training and experience. Such a reply will show at once what portions of the course will prove very easy because of experience and what parts if any are likely to give difficulty. In all cases the student is asked to bring up his problems for discussion with the hope that a few words from the instructor will remove any difficulties existing. In some cases it is found that a student has special knowledge or has had some especially valuable experience and he is asked to give information which serves to broaden the knowledge of the instructor and which may be used to help other students.

The questions at the end of each assignment, or each section of an assignment, are intended as indicators of the student's understanding of the subject covered. They cover only a few points in each assignment or section, but the kind of answer given shows whether a student is really studying, or only looking first at the questions and then looking up the answers. This latter course is possible, but if a set of answers should indicate it, other questions would be sent.

Old King Coal

OLD King Coal, the merry old soul, is the grandfather of the gas industry. While very little is known about the King's parents, we are told he descended from the woody parts of trees, resins from gums and waxes, and residue from nitrogenous compounds. This was in the carbonaceous age.

The King had two sons, Anthracite and Bituminous. Being the older and being subjected to greater pressure, Anthracite became harder and brighter. He had one son, Semi-Anthracite, who like his father remained in the Pennsylvania district throughout all these centuries and is still considered one of the most important inhabitants of that state.

Bituminous, the second son, proved to be the black sheep of the family. He was not as well fixed in carbon as his older brother; he associated more with oxygen, nitrogen and hydrogen. He even smoked when heated. Bituminous was of a roving disposition, had a large family, and today we find his sons, Low, Medium and High Rank Bituminous in many states of the union from Alabama to New Mexico.

Because of the nature of the Bituminous children and their willingness to give up gas, tar, ammonia and other products, the gas industry readily adopted them as their own children.—ELMER H. PAULL

(Part of student's answer to homework question, 1934-35 Gas Engineering Course, The Brooklyn Polytechnic Institute.)

TECHNICAL SECTION

Protecting Bolts and Nuts of Mechanical Pipe Joints and Leak Clamps from Electrolytic Corrosion

J. A. Perry

By J. A. PERRY
The United Gas Improvement Company, Philadelphia, Pa.

AT the 1934 Distribution Conference in Detroit a paper was presented entitled "Improvements to Mechanical Pipe Joints and the Prevention of Bolt and Nut Corrosion." This paper was printed and distributed at the 1934 A. G. A. meeting. The general conclusions were:

1. Insulating the bolts should reduce electrolytic corrosion of the bolts and nuts.
2. Capping the nuts and heads of the bolts with an insulating material filled with a waterproof plastic should protect the nuts and heads from corrosion.
3. Shielding the heads and shanks of the bolts with metallic shields as is the case with the Flexklamp and R. D. Wood joints should satisfactorily protect these parts of the bolts from serious corrosion.
4. The exposed shanks of bolts between flanges should be satisfactorily protected against serious corrosion by the use of suitable waterproof compressible sleeves or grommets.
5. Shielding the nuts of bolts with metallic shields which form an integral part of the follower ring should greatly reduce the corrosion of the nuts and threaded ends of the bolts. Filling these recesses or inverted caps with a suitable waterproof plastic material should practically prevent corrosion of the nuts and threaded ends of the bolts.
6. Shielding the heads and the nuts of the bolts with separately formed metal cup washers should greatly reduce the corrosion of the heads, nuts and threaded ends of the bolts. Filling these recesses or inverted caps with a suitable waterproof plastic material should practically prevent corrosion of these parts.
7. Suitable flexible waterproof caps forced or cemented on over the heads and nuts of the bolts should practically eliminate corrosion of these parts.

Shielding Assures Long Life

Additional tests have been made to determine how practical the method of shielding the ends of the bolts and nuts might be in joints designed to have the follower ring protect the head and shank of the bolt. Tests were also made to determine the comparative value of shielding the head of the bolt and the nut, and of installing a flexible grommet around the shank of the bolt as compared to protecting the whole joint with an enamel, such as Bitumastic.

All of the tests that we have made would indicate that shielding offers the most practical method of assuring a nut and bolt life which will be equal to the life of the pipe line.

The Carson-Cadillac Corporation is producing a cast iron cap for shielding the nuts of the Flexklamp or R. D. Wood joint or other joints which use the same size bolt and nut.

The American Cast Iron Pipe Company is offering a redesigned Doublex-Simplex joint which shields the shank of the bolt. The nuts and bolt heads of this joint are extra heavy and designed to lengthen the life of these parts.

Rubber Caps

A cap of rubber seems to offer some advantages. Prelimanary tests were made using rubber caps that were originally made as caps for acid bottles. These tests were promising enough to encourage the Manhattan Rubber Company to make some rubber caps for protecting the bolt heads and nuts. These caps were exhibited by some of the pipe manufacturers at the A. G. A. Convention in Atlantic City this year.

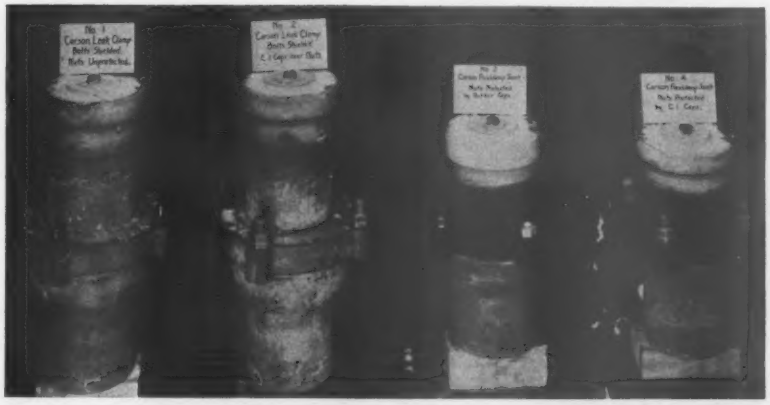


Figure 1

Figure 2

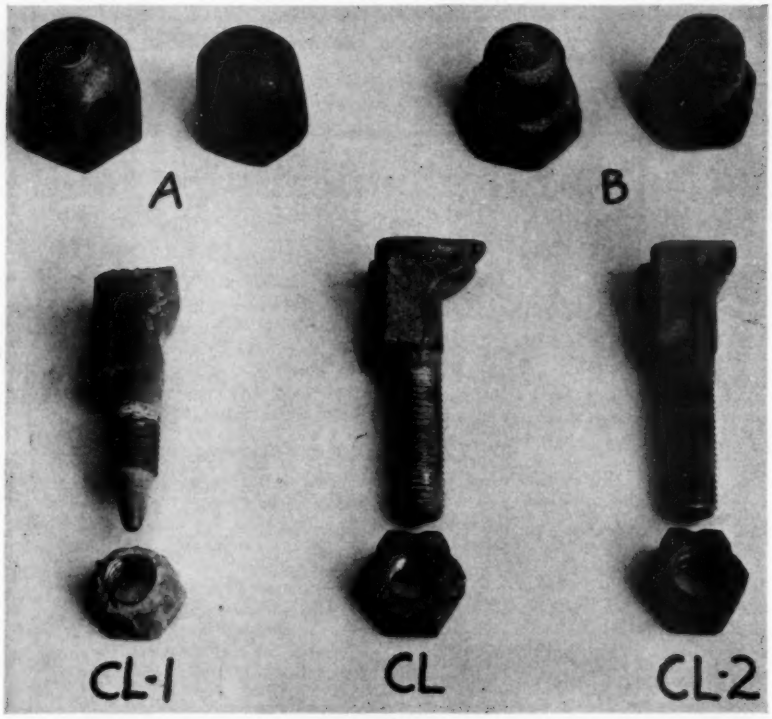


Figure 3

The rubber caps of special composition as applied to a Doublex-Simplex joint are shown in Figure 7 and as applied to an R. D. Wood joint are shown in Figure 8.

Two forms of the cast iron caps produced by the Carson-Cadillac Corporation were tested and some of the rubber caps used normally as bottle caps were tested when applied to mechanical joints and to leak clamps that are so designed as to shield the heads and shanks of the bolts. A leak clamp with unprotected nuts was used for comparative purposes.

Results of Test

Four Dresser leak clamps were tested. One clamp had the nuts, heads and shanks of the bolt protected by rubber caps and grommets. One clamp was protected by Bitumastic enamel so applied as to leave occasional holidays or bare metal exposed as might be the case in the field. One clamp was protected by Bitumastic enamel applied thoroughly and completely as was possible under laboratory conditions. The other clamp was used with cadmium plated bolts and nuts and no protection was supplied to any of the metallic surfaces.

It was believed that this test would show whether the cast iron or the rubber caps or both would be a satisfactory method of protecting the nuts in mechanical pipe joints.

It was believed that a comparison between the protection offered to the bolts and nuts by rubber caps and grommets, by Bitumastic enamel and by chromium plating could be obtained by using leak clamps of the Dresser type. This type of clamp leaves the bolt head, nut and practically all of the bolt shank exposed.

Tables Nos. 1 and 2 and the photographs show the results of the test.

Figures 1 and 2 show the joints assembled before the test was made. Figure 3 shows the bolts from the Carson leak clamps after the test was completed. The middle bolt is a new bolt which was not in the test.

Due to using somewhat odd size bells the toes of the bolts used in the test were turned off as shown in the tested bolts at either side of the figure, before they were installed. Practically no metal was lost from the toe of these bolts by corrosion.

Note that the protected nut and threaded end of the bolt in CL-2 is practically as good as when installed, while the unprotected nut and threaded end of the bolt as shown in CL-1, Figure 3, and installed in joint No. 1, Figure 1, is practically gone.

A and B, Figure 3 show two forms of the cast iron nut protectors before and after testing.

Figure 4 shows bolts and nuts from the Carson Flexklamp joint, before and after testing.

CF, Figure 4 is a new bolt and nut, CF-4 is a bolt and nut after the corrosion test was completed, the nut and the end of the bolt having been protected by a cast iron cap. CF-3 is a nut and bolt after the test was completed, the nut and end of the bolt having been protected by a rubber cap. Note the good protection offered by these caps.

From Table No. 1, the loss of the capped nuts was .5% to 2.4% compared to a loss of 34.6% for the uncapped nuts.

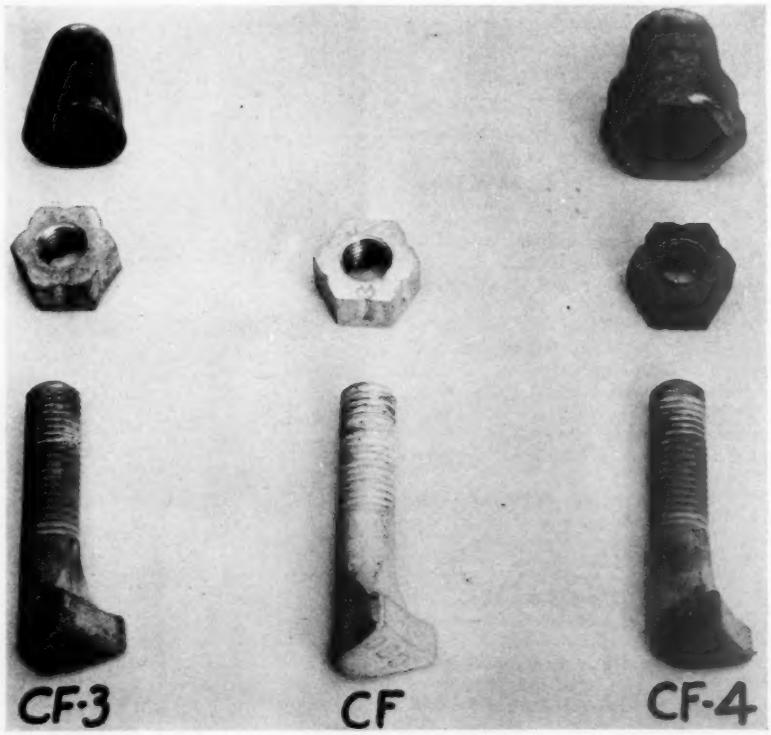


Figure 4

TABLE NO. 1

PER CENT LOSS IN WEIGHT OF PARTS OF CARSON LEAK CLAMPS AND JOINTS

No.	Type	Bell and Spigot		Gland	Bolts	Nuts	C.I. Caps
1	Carson Leak Clamp Nuts unprotected	2.4		14.0	11.5	34.6	
2	Carson Leak Clamp C.I. Nut Covers	2.3		11.0	3.4	0.5	39.6
3	Carson Flexklamp Rubber Nut Covers	4.6	3.9	12.8	4.1	2.4	
4	Carson Flexklamp C.I. Nut Covers	4.1	2.6	9.7	4.6	1.8	33.7

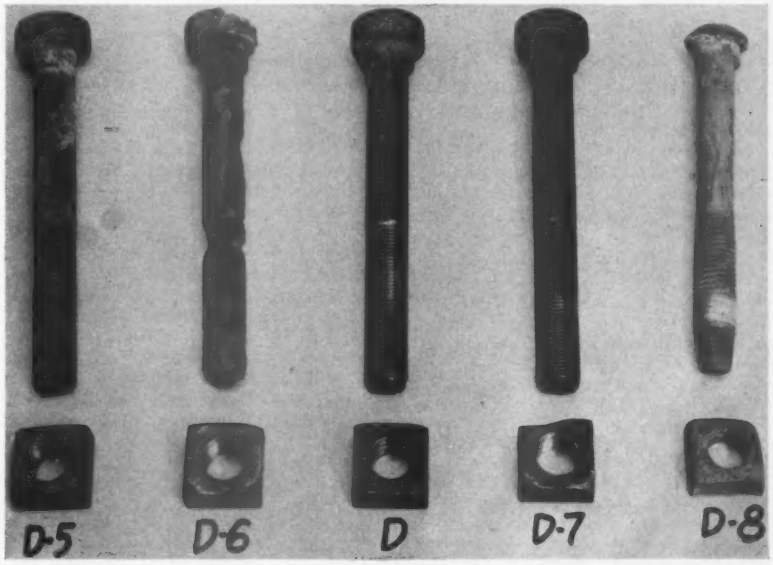


Figure 5

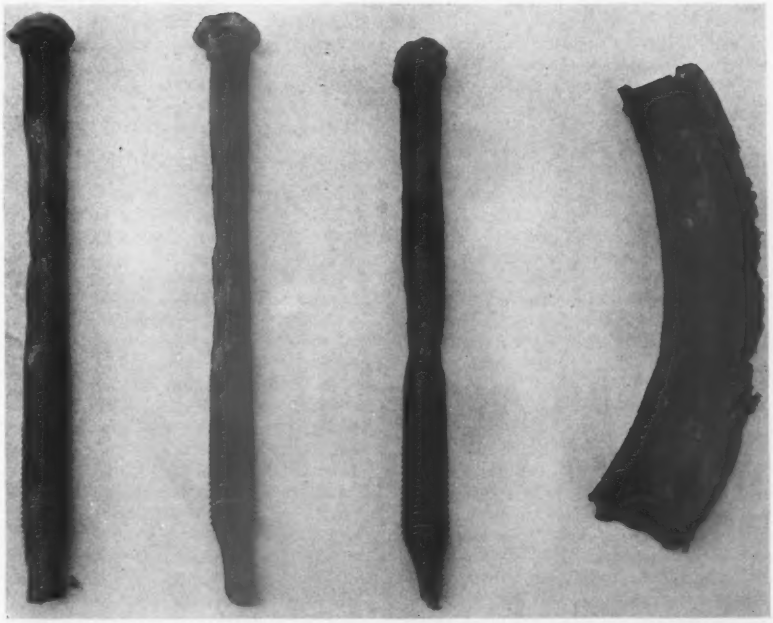


Figure 6. Bolts and section of rubber gasket removed October, 1934, from a 30" leak clamp installed September, 1905

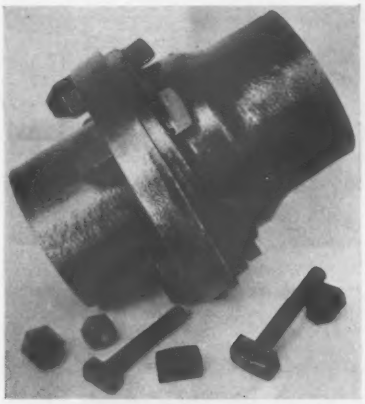


Figure 7. Doublex-Simplex Joint with rubber nut and bolt head covers

The nuts that were protected by the rubber caps lost a bit more metal than those protected by the cast iron caps. This was seemingly due to the rubber cap not seating down against the follower ring, a thin section of the nut was therefore exposed to corrosion. We believe this can be avoided when the rubber caps are made specifically for this purpose and service; as a further precaution a small amount of rubber cement can be used to seal the joint between the rubber cap and the follower ring.

Of course, the cast iron caps lost a large amount of metal as was expected and ultimately the nuts would be corroded but it must be remembered that the purpose of the protection is not to make the bolts and nuts last forever but to extend their life to equal that of the pipe line on which they are installed. It is believed that this method of capping the nuts and of protecting the head and shank of the bolts by the follower ring will give a joint life which will be equal to the life of the pipe line.

As shown by Table No. 2, the rubber caps and grommets gave almost complete protection to the bolts and nuts in the Dresser leak clamp. The good Bitumastic job also gave almost complete protection to the bolts and nuts although the nut loss is higher than when the rubber caps were used. It must be remembered, however, that this good Bitumastic job was made in the laboratory under almost ideal conditions and in practice the Bitumastic job would probably have a few holidays and would probably give results which would be somewhere between the good and the poor Bitumastic jobs used in the test. The cadmium plated nuts and bolts may be used to compare the loss from unprotected bolts and nuts since under the test conditions cadmium plating offers almost no protection.

Figure 2 shows the condition of the Dresser leak clamps before the test was started.

Figure 5 shows the bolts and nuts removed from these leak clamps when the test was completed.

D, Figure 5 is a new and unused bolt and nut for the Dresser leak clamp.

TABLE NO. 2

PER CENT LOSS IN WEIGHT OF PARTS OF DRESSER LEAK CLAMPS

No.	Type	Bell and Spigot	Back Ring	Follower Ring	Bolts	Nuts
5	Dresser Leak Clamp Bolt heads, shanks and nuts rubber protected	4.0	25.7	17.7	0.9	0.7
6	Dresser Leak Clamp Hot Bitumastic Poor Job	2.1	15.4	7.6	7.1	14.3
7	Dresser Leak Clamp Hot Bitumastic Good Job	0.9	3.9	0.0	0.0	3.8
8	Dresser Leak Clamp Bare—Cadmium Plated Nuts and Bolts	2.0	18.6	11.7	18.3	13.7

Figure 8

D-5 shows a bolt and nut at the end of the corrosion test that were protected with rubber shields.

D-6 shows a bolt and nut at the end of the corrosion test that were protected with a poor Bitumastic job.

D-7 shows a bolt and nut at the end of the corrosion test that were protected with a good Bitumastic job.

D-8 shows a bolt and nut at the end of the corrosion test that were cadmium plated and unprotected.

Note from D-6, Figure 5, that the protection offered by a poor Bitumastic job is negative since the corrosion in this case tends to pit the bolt and so weaken it more than when the corrosion is uniform as at D-8, Figure 5 for the unprotected bolt.

Figure 6 shows some bolts and a section of rubber gasket removed in October 1934 from a 30 inch leak clamp that was installed in September 1905. Note the similarity of the corrosion of the bolts from service in Figure 6 and of the unprotected cadmium plated bolt from the corrosion test, shown in D-8, Figure 5.

Summary

The method of shielding the nuts, and when necessary, the heads and shanks of the bolts by cast iron or rubber caps and grommets offers a practical and economical method of extending the life of the joint to equal the life of the pipe line.

Laboratory Pioneers in Testing Safety Devices

THE A. G. A. Testing Laboratory has extended its activities to include a certification schedule for automatic devices to prevent escape of unburned gas, commonly known as thermostatic pilots. Manufacturers wishing an assurance of proper operation of correctly installed thermostatic pilots are now assured of this by having their accessories tested under the recently adopted Listing Requirements for Automatic Devices Designed to Prevent Escape of Unburned Gas.

This set of requirements combines under one cover the experience of the industry and the Association's requirements committees in addition to the practical data made available through an extended program of investigation of all available types and makes of such equipment by the Laboratory. The standards include constructional requirements covering such subjects as adjustments, strength, assembly, marking, and resistance to corrosion. Performance tests are made to determine time of operation to open and close, pilot operating characteristics, ability to endure continued operation, capacity and leakage.

Devices which comply fully with the tests outlined in the above-mentioned listing requirements are entitled to bear the Laboratory Listing Symbol. The experienced staff of the Laboratory is trained and equipped to conduct these tests and offer assistance to manufacturers desiring A. G. A. listing.

Information concerning the test procedures and policies as well as copies of the requirements may be secured from the A. G. A. Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio.

Certifying Relief Devices for Water Heating Systems

MANUFACTURERS of water heaters and relief valves should enjoy several benefits from the facilities now available at the Association's Testing Laboratory for examining and certifying relief and automatic gas shut-off valves.

The opportunity offered the industry for obtaining a complete series of tests on these devices satisfies a long recognized need for a reliable source of information concerning them. The new Listing Requirements for Relief and Automatic Gas Shut-Off Valves for Use on Water Heating Systems were prepared by the Association's committees after several years of extensive research. The trained staff of engineers at the A. G. A. Laboratory, where all research and tests incident to the drafting of the requirements were conducted, are equipped to assist manufacturers in obtaining certification and listing of their equipment.

The new requirements include constructional and performance standards for four different types of these devices; namely, pressure, temperature, and vacuum relief valves and automatic gas shut-off valves. Limits are prescribed for relieving and reseating temperature, pressures, or vacuum, discharge rates are specified, and the valves are tested for leakage, resistance to deterioration, etc. Construction requirements include durability and convenience features as well as safety standards.

The committee in charge of the preparation of approval requirements for gas water heaters has adopted the majority of the tests appearing in the relief valve standards, and the general policy now in effect of correlating the requirements for accessories with those for approval of appliances will probably result in the incorporation of practically the entire listing standards in the approval requirements.

Certification of relief devices under the new listing requirements will afford advance assurance of their satisfactory performance when properly installed on appliances. It should also help to eliminate service complaints, and be of material assistance to manufacturers and the industry in general, since in all probability the listing standards will be followed by many local and state regulatory bodies.

Stanley Jenks Joins Bastian-Morley Company

RESIGNATION of Stanley Jenks from the staff of the Northern Indiana Public Service Company, Hammond, to accept a position as manager of the eastern division of the Bastian-Morley Company, has been announced at Hammond, Indiana, by Dean H. Mitchell, vice-president and general manager of the Northern Indiana Public Service Company.

Mr. Jenks had been manager of residential and rural sales for that company and for the Indiana Service Corporation and Gary Heat, Light & Water Company. He came to Hammond in 1920 from The United Gas Improvement Company.

In the utility field Mr. Jenks is widely known, having been chairman of the Midwest Sales Conference of the American Gas Association for 1932-33; chairman of the national water heating committee of the American Gas Association, and a speaker at the national and regional sales convention of both the gas and electric utilities.

TESTING LABORATORY

R. M. CONNER, Director Managing Committee: J. S. DeHART, Jr., Chairman N. T. SELLMAN, Secretary

Semi-Rigid Gas Tubing Tested and Certified By A. G. A. Laboratory

By F. R. WRIGHT

A. G. A. Testing Laboratory
Cleveland, Ohio

LISTING requirements for semi-rigid gas appliance tubing and fittings were recently completed by committees of the American Gas Association, with the result that manufacturers of such products may now submit their equipment to the Laboratory for testing and listing.

Copper, brass and aluminum tubing has come to be extensively used by the gas industry in the construction of gas appliances and for connecting gas appliances to house piping. Semi-rigid tubing is used almost exclusively in the connection of gas refrigerators, while through the South and Southwest this type of gas connection is, in addition, used extensively for radiant heaters and other types of portable appliances. Furthermore, the many accessories and controls now employed on gas appliances, such as gas ranges, require the use of many feet of tubing per appliance. Figure 1 shows a typical layout of piping and tubing for a modern gas range. Even much more tubing than that shown in the accompanying photograph is used on some automatic controlled ranges, especially where double ovens are employed.

Nature of Tests

Not only must such tubing be capable of being formed or bent into numerous shapes without damage so as to be used for various applications on appliances, but must withstand relatively high temperatures, must not corrode or season crack, must be capable of withstanding a reasonable amount of vibration without developing cracks or flaws and must not leak gas under any condition. All these contingencies and many others are taken into account in the newly developed standards for semi-rigid gas appliance tubing and fittings.

In the development of these requirements due consideration was given to all available specifications and standards previously developed by other organizations, including those prepared by the Federal Government, the U. S. Army, U. S. Navy, the English Government, the American Society for Testing Materials, the Society of Automotive Engineers, and the Underwriters' Laboratories. A detailed study of twelve sets of specifications prepared by such organizations disclosed the fact that no two sets were exactly or even very closely in agreement. Certain general similarities in regard to such factors as purity of materials, appearance, and dimensions were noted, but the standards and methods of test relative to physical properties were in most cases at considerable variance.

From Table 1, it will be seen that all of the specifications previously referred to were similar to the extent that requirements for certain properties were included, but a study of them discloses differences in practically every case regarding the detailed requirements for similar properties.

Some of the specifications for semi-rigid tubing for use in particular industries seemed fairly applicable to gas appliances while others seemed to possess little significance in this respect. All in all, none of the standards or specifications in existence seemed to be sufficiently comprehensive or generally applicable to the particular needs of the gas industry in so far as the use of such tubing for connecting appliances or appliance accessories was concerned.

Specific Problems

Among the specific problems relating to the use of semi-rigid tubing on gas appliances and accessories are those pertaining to the effects of temperature and the possibilities of corrosion or oxidation. The fact that tubing and fittings may be located near, or even in the combustion chamber of a gas appliance, indicates the need for assurance that tubing will not become plastic or melt under the temperature conditions which may be encountered.

In deciding on what minimum melting temperature should be specified for semi-rigid tubing, it became necessary for the committees preparing the requirements to know what the maximum temperatures were that might be encountered in combustion chambers of appliances. Investigations conducted by the American Gas Association's Laboratory in conjunction with various projects disclosed that temperatures in the neighborhood of gas burner valves may reach 300° F. on some open top gas ranges and as high as 500° F. for some closed top ranges. This condition no longer exists, however, for gas range valves since the present approval requirements for ranges limit the temperature of gas cock bodies to a maximum of 300° F. Special provisions are usually incorporated in ranges now, however, to shield or insulate gas cocks to a certain extent from the heat of the combustion zone. Considerably higher temperatures will, consequently, be encountered in the combustion chambers proper of top, oven, and broiler sections where tubing to lighters, thermostats, and other controls may be employed. It is probable, however, that such temperatures would not exceed 600° F.

Special precautions by insulation are also taken in many cases in the construction of ranges to prevent excessive temperatures on such parts. This precaution is unnecessary from the standpoint of danger of melting or softening of the tubing since copper, brass, or aluminum are usually employed, the melting points of which are much above the temperatures attained. Such temperatures as are reached, however, may accelerate corrosion of tubing and fittings used for gas conduits, and also may interfere with the functioning of controls such as thermostats which are dependent for operation on a temperature differential. It is, consequently, to prevent interference with the operation of such controls that precautions for shielding or insulation are generally employed.

Combustion Temperatures

Determinations of combustion chamber temperatures of three gas water heaters, two boilers, and one furnace, in conjunction with a study of the operation of thermostatic pilots, disclosed that the average temperature attained by these appliances when operated until equilibrium temperatures were attained, was approximately 600° F. A further investigation of water heater combustion space temperatures during which six representative makes of internally fired and side-arm heaters were studied, showed temperature variations in the combustion chamber, from the coolest point to a position in or near the flame, ranging from 114 to 1254° F. The range of temperatures of the thermal elements of the pilots, which were probably nearer the point of maximum combustion chamber temperature than any of the semi-rigid tubing employed, varied from 350 to 555° F., with an average temperature for the elements of all heaters of 431° F.

From the results of the various Laboratory investigations and the general factors involved in the design of appliances, it may be reasonably concluded that in few, if any, cases would tubing employed in the construction of domestic gas appliances be exposed to temperatures in excess of 700° F. In order to provide a reasonable factor of safety, however, the recently completed listing standards for semi-rigid gas appliance tubing and fittings include a requirement which specifies that such tubing and fittings must be capable of withstanding a temperature of 1000° F. without melting or being deformed in any way.

The melting points of several substances which have been or which may be used for tubing are shown in Table 2.

Corrosion Studies

The Testing Laboratory has, during the past five or six years, received reports at various times from many sections of the country concerning the causes and nature of corrosive action affecting semi-rigid tubing and other equipment used on gas appliances. In addition, it has made extensive surveys and conducted several investigations relative to various phases of this general problem. Furthermore, many gas companies as well as the National Bureau of Standards, and the U. S. Bureau of Mines, have from time to time made researches and issued reports relating to certain types of corrosive action. Although there is a fund of information available relative to certain phases of corrosive and oxidizing action,* it was found necessary for the Testing Laboratory to make further study of the problem as it related to semi-rigid tubing, in order to recommend equitable limits for the establishment of performance requirements by the interested committee. Performance requirements relative to both corrosion and oxidation are, as a result, included in the standards for semi-rigid gas appliance tubing and fittings, which should give reasonable assurance against failure of tubing complying with the requirements, due to these factors.

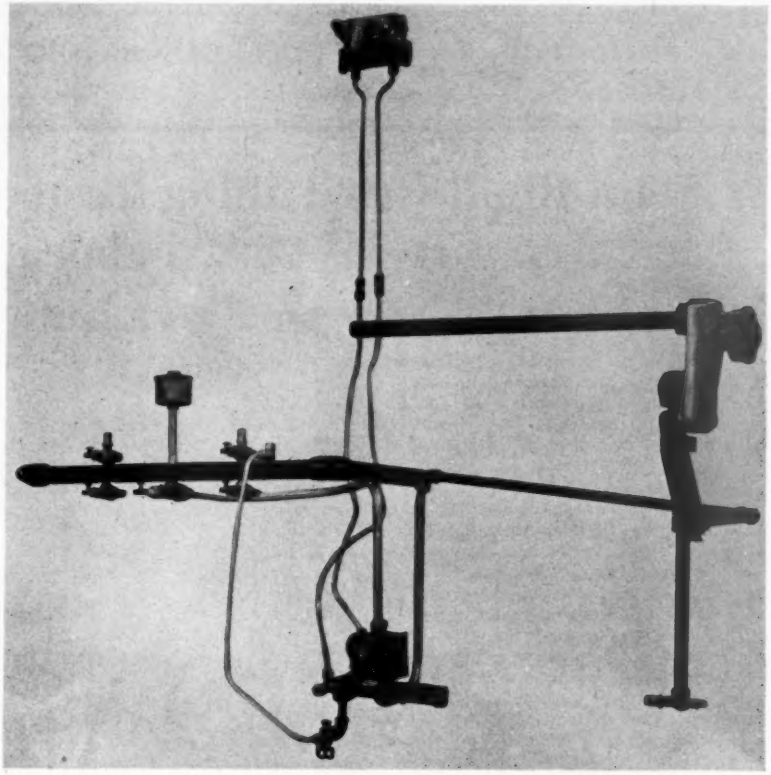


Figure 1. Internal piping of modern gas range showing tubing and automatic controls employed

Tests in the Laboratory and experience gained through the use of appliances in the field have demonstrated conclusively that temperature has a very decided bearing on the speed of oxidation of materials such as those used for semi-rigid tubing. Where such tubing is used for gas conduits the corrosive action is also greatly accelerated at higher temperatures. There is no definite line of demarcation respecting the effects of temperature, but it is known that at temperatures of 350° F. or higher corrosive action takes place at a rate much above

* See bibliography of literature on corrosion and oxidation appearing at the end of this paper.

Table I

SUMMARY OF EXISTING SPECIFICATIONS FOR SEMI-RIGID TUBING

Authority	*Nature of Specification*												
	Purity	*Appearance*	*Dimensions*	*Weight*	*Tensile Strength and Elongation*	*Hydrostatic Pressure Test*	*Bend Test*	*Flattening Test*	*Flaring Test*	*"Season Cracking"*	*Vibration Test*	*Fittings*	*Marking*
British Standard Specifications for Copper Tubes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
U. S. Navy Specifications for Tubing, Copper, Seamless	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
A. S. T. M. Specifications for Seamless Copper Tubes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No	No
A. S. T. M. Specifications for Seamless Copper Tubing, Bright Annealed, Tentative	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes†
S. A. E. Specification for Copper Tubing	Yes	Yes	Yes	No	No	No	Yes	No	Yes	No	No	Yes	No
Underwriters' Laboratories Std. for Seamless Drawn Annealed Copper and Brass Tubing	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
U. S. Navy Specifications for Tubing, Brass, Seamless	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No
S. A. E. Specification for Annealed Seamless Brass Tubing	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No
U. S. Navy Specifications for Tubing, Aluminum	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	No	No	No
U. S. Navy Specifications for Tubing, Aluminum Alloy	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	No	No	No
U. S. Army Specification for Aluminum Tubing	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	No	Yes†
U. S. Army Specification for Aluminum Tubes	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes†

†Marking of Packing Boxes only.

TABLE 2

MELTING POINTS OF VARIOUS METALS AND ALLOYS

Material	*Melting Point—° F.*
Copper	1,981
Aluminum	1,220
Brass, ordinary	1,724
97% Al., 3% Cu.	1,184
90% Al., 10% Cu.	1,166
Zinc	786
Lead	621

that occurring at room temperatures. The requirement included in the semi-rigid tubing standards concerning resistance to corrosion is, consequently, divided into two classes, one applying to tubing for use in locations where the temperature is not in excess of 350° F., and the other for tubing located where it may be exposed to temperatures above this figure.

Hydrogen sulphide and oxygen are, unquestionably, almost entirely responsible for premature failure of semi-rigid gas appliance tubing in service. The life of certain types of metallic tubing is affected, therefore, to a considerable extent by the sulphur compounds, if any, present in the gas supply. Many city gases contain no sulphur of any kind while the amount permitted in any city gas is generally limited by law to very minute quantities. Nevertheless, traces are present in some gases, usually in the form of hydrogen, sulphide, carbon bisulphide, mercaptans, thiophene, and other complex compounds. Of these, hydrogen sulphide, which is often the predominant sulphur compound in the gas, probably has the most destructive effect on metals.

H_2S Reactions

The reactions of hydrogen sulphide with metals such as copper, aluminum or zinc, form sulphides with the liberation of nascent hydrogen. The hydrogen thus evolved tends to reduce the sulphides with formation of free sulphur. Sulphides are generally quite permeable; therefore, they do not provide a protective coating.

The reaction between sulphur compounds and tubing materials is greatly accelerated at high temperatures. The speed of this reaction is also, in some cases, proportional to the sulphur concentration, gas flow, size of tubing, and moisture content of the gas, although quantitative expressions of the effects of these factors have not, to the writer's knowledge, ever been definitely established. Traces of less than 4 grains of hydrogen sulphide per 100 cubic feet of gas have, however, been found to cause considerable difficulty, due to its corrosive action on certain types of metal tubing where such tubing was located in the heat zone of appliances.

At high temperatures atmospheric oxygen has considerable effect on the corrosion of semi-rigid tubing materials. At ordinary room temperatures, however, this reaction may be considered as negligible.

Contrary to the characteristics of sulphides, which are quite permeable, oxides of metal tend to form a protective coating or film on the surface of the tubing. The destructive action of oxidation may, however, become quite pronounced at high temperatures.

Available information indicates that oxidation of metals commonly used for tubing is not greatly affected by the concentration of oxygen in the gas supply nor by the rate at which the gas flows. The presence or absence of water vapor in the gas supply, likewise, seems to be of little importance from this standpoint. The data available regarding these factors, however, are somewhat limited and some divergence of opinion seems to exist as to their relative importance.

The testing and certification of semi-rigid gas tubing and fittings in accordance with the newly developed construction and performance standards should go a long way toward overcoming troubles experienced with this type of equipment in the past. Such a program should also have the effect of eliminating from the market cheap and shoddy material of this character, and in general, decrease the possibility of failure of tubing and fittings in service.

Information regarding test procedures, etc., as well as copies of the requirements, may be secured upon application to the American Gas Association Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio.

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Appliance Testing Active at Both A. G. A. Laboratories

CONTRARY to the usual seasonal trend in appliance testing the Laboratory's work in November showed an increase of 11.4 per cent over the preceding month and an increase of 99.5 per cent over the corresponding month of 1933.

The testing of gas ranges, space heaters, water heaters and central heating gas appliances continued to constitute the major part of this branch of the Laboratory's work, although considerable activities were evidenced in the testing of hotel and restaurant ranges and gas conversion burners.

The completion of standards for all types of gas appliance accessories has also resulted in the submission of several types of such equipment for test. The most activity along this line has been on conversion burners and gas burner valves, although several gas pressure regulators as well as other accessories have accounted for a small part of the increased test work.

Reports from the Laboratory's inspectors, who are now engaged in making the annual factory inspections of all approved appliances, indicate an increase of business in the appliance manufacturing field.

A Parable

A stage coach driver was very adept with his long whip. He could clip a daisy at twenty feet. A passenger suggested that he cut down a hornet's nest hanging on a limb.

"No sir," said the driver. "That's an Organization."

Monthly Summary of Gas Company Statistics

For Month of October, 1934

Issued December, 1934, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Chief Statistician

COMPARATIVE DATA ON THE MANUFACTURED AND NATURAL GAS INDUSTRY FOR THE MONTH OF OCTOBER

	Month of October			Ten Months Ending October 31		
	1934	1933	Per Cent Change	1934	1933	Per Cent Change
Customers						
Domestic (Including House Heating)	14,904,700	14,564,500	+ 2.3			
Industrial and Commercial	741,800	724,200	+ 2.4	*See October*		
Total	15,646,500	15,288,700	+ 2.3			
Revenue (Dollars)						
Domestic (Including House Heating)	38,521,700	38,633,100	— 0.3	420,521,800	422,547,300	— 0.5
Industrial and Commercial	14,790,300	13,945,800	+ 6.1	152,893,400	136,209,800	+12.2
Total	53,312,000	52,578,900	+ 1.4	573,415,200	558,757,100	+ 2.6

COMPARATIVE DATA ON THE MANUFACTURED GAS INDUSTRY FOR THE MONTH OF OCTOBER

Customers						
Domestic	9,525,500	9,386,800	+ 1.5			
House Heating	105,700	68,300	+54.8			
Industrial and Commercial	442,200	437,600	+ 1.1	*See October*		
Miscellaneous	9,200	8,800	—			
Total	10,082,600	9,901,500	+ 1.8			
Gas Sales (MCF)						
Domestic	20,860,300	21,017,300	— 0.7	201,996,300	203,269,600	— 0.6
House Heating	1,236,600	836,100	+47.9	21,923,300	14,636,700	+49.8
Industrial and Commercial	7,060,100	6,179,400	+14.3	72,553,600	60,843,300	+19.2
Miscellaneous	184,200	181,000	—	1,764,900	1,670,000	—
Total	29,341,200	28,213,800	+ 4.0	298,238,100	280,419,600	+ 6.4
Revenue (Dollars)						
Domestic	25,480,100	25,715,600	— 0.9	246,351,800	249,430,800	— 1.2
House Heating	909,700	621,100	+46.5	14,598,300	10,617,400	+37.5
Industrial and Commercial	5,512,300	5,241,100	+ 5.2	55,902,400	53,093,500	+ 5.3
Miscellaneous	129,200	127,200	—	1,242,900	1,264,900	—
Total	32,031,300	31,705,000	+ 1.0	318,095,400	314,406,600	+ 1.2

COMPARATIVE DATA ON THE NATURAL GAS INDUSTRY FOR THE MONTH OF OCTOBER

Customers						
Domestic (Including House Heating)	5,273,500	5,109,400	+ 3.2			
Commercial	265,800	254,800	+ 4.3			
Industrial	22,700	21,300	+ 6.6	*See October*		
Miscellaneous	1,900	1,700	—			
Total	5,563,900	5,387,200	+ 3.3			
Gas Sales (MCF)						
Domestic (Including House Heating)	15,569,800	15,135,200	+ 2.9	230,859,200	232,141,900	— 0.6
Commercial	3,092,400	2,890,500	+ 7.0	44,078,000	42,017,200	+ 4.9
Industrial	47,740,100	42,991,700	+11.0	465,283,300	379,138,000	+22.7
Miscellaneous	854,300	661,900	—	10,005,000	6,765,300	—
Total	67,256,600	61,679,300	+ 9.0	750,225,500	660,062,400	+13.7
Revenue (Dollars)						
Domestic (Including House Heating)	12,131,900	12,296,400	— 1.3	159,571,700	162,499,100	— 1.8
Commercial	1,548,600	1,510,000	+ 2.6	20,253,700	19,657,700	+ 3.0
Industrial	7,458,400	6,956,500	+ 7.2	73,898,700	61,026,500	+21.1
Miscellaneous	141,800	111,000	—	1,595,700	1,167,200	—
Total	21,280,700	20,873,900	+ 1.9	255,319,800	244,350,500	+ 4.5

Gas Revenues Increase for First Ten Months

DURING the first ten months of 1934 revenues of the manufactured and natural gas industry increased 2.6 per cent, rising from $558,757,100 in the first ten months of 1933 to $573,415,200 in the corresponding period of 1934.

The manufactured gas companies reported revenues of $318,095,400 for the ten months, or 1.2 per cent more than for the same period of the preceding year, while revenues of the natural gas utilities aggregated $255,319,800, an increase of 4.5 per cent.

Sales of manufactured gas reported for the ten-month period totalled 298,238,100,000 cubic feet, a gain of 6.4 per cent, while natural gas sales were 750,225,500,000 cubic feet, an increase of 13.7 per cent over the corresponding period of last year.

A significant feature of the data reported by the manufactured gas companies was an increase during the year of nearly 55 per cent in the number of customers using gas for house heating purposes.

Architect's Reference Book

THE magazine *American Architect*, has recently published an architect's reference data book covering heating, cooling and air conditioning. By skillful blending of technical and non-technical language most of the factors affecting house heating and winter and summer air conditioning have been put into chapters that should be easily understood by gas men. These chapters include characteristics of available equipment, how to estimate loads, individual room data sheets for winter air conditioning, individual room data sheets for summer air conditioning, and a particularly interesting data sheet for calculating all the factors for any building affecting both winter and summer conditions.

A section devoted to economic study of equipment is unique in publications of this kind. Complete tables showing both winter and summer climatic conditions in all the important cities of the United States are also shown.

A similar booklet describing distribution equipment for heating, cooling and air conditioning has also just been released by the American Architect.

—E. D. M.

Electrolux Sales Increase

AN optimistic picture for the marketing of Electrolux refrigerators in 1935 was painted by executives, sales, advertising and promotion managers, at the annual Servel sales conference which was attended by more than a hundred field representatives of the company. The conference was held in Evansville, Ind., and lasted throughout the week of December 11-15.

F. E. Sellman, vice-president in charge of distribution, who presided at all the sessions, told of the company's success during the present year with sales 49 per cent above those of the previous year. Present indications, Mr. Sellman stated, presaged further gains, in support of which he further announced that factory shipments from November 1 to December 10, 1934, showed an increase of 237 per cent over those in the similar period in 1933.

Visitors to the Laboratory

AMONG the many visitors to the Cleveland Laboratory during the past month were Walter J. Podbielniak, inventor of the fractionation analysis apparatus bearing his name, and J. R. Gramm of the United States War Department, who spent several days at the Laboratory observing tests made on water heaters to be purchased by the Federal Government for various army bases.

Both the Cleveland and Los Angeles Laboratories are frequent hosts to scientific and educational groups interested in the Association's appliance testing and approval program.

Many of the delegates to the fall meeting of the Division of Gas and Fuel Chemistry, American Chemical Society, recently held in Cleveland, took advantage of the opportunity to inspect the Cleveland organization.

The Senior Class in Heating and Ventilating of Case School of Applied Science in Cleveland also made an inspection tour of the Testing Laboratory during the past month. Likewise, a large class in Home Economics from the University of California at Los Angeles visited the Pacific Coast branch.

The growing interest of high schools, colleges and universities in the gas industry's appliance testing and approval program is becoming increasingly manifest by the large number of requests for material and information received from such organizations each month.

Telemetering System

An electronic relay, by transforming minute electrical currents into useful forces, plays an important part in a new telemetering system recently developed by Bailey Meter Company, Cleveland, Ohio, for measuring pressure, temperature, liquid level, and other factors, at distant locations. The electronic relay operated Galvatron receiving element records as many as four factors on one 12-inch diameter circular chart. The transmitting element consists principally of a variable resistance unit which is operated by a metering device.

The Democratic A. G. A.

Under the above title the following comment recently appeared in The Gas World, London:

WHILE making his arrangements to attend the annual convention of the American Gas Association at Atlantic City, your correspondent falls into a reminiscent mood as he casts a backward glance over the years gone by and remembers some of the association meetings he attended in Britain. While there is no patriot like an expatriate, we must concede that some things are done better in the States.

For instance, anyone connected with the gas industry, no matter in what capacity, is eligible for membership in the A. G. A. It is not surprising, then, that an attendance of 5,000 has been chalked up at some of our national gas conventions over here. The writer remembers when he was admitted a full fledged member of a British gas association simply by virtue of being able to tack on the magic word "manager" after his name. Yet his was a small job where, instead of utilizing his technical training, he had, among other duties, that of collecting the monthly gas bills.

The strangeness of the set-up of that association lay in the fact that many older men much further advanced in the profession, but who could only claim to be assistant managers of large works, had to be content with membership as associates. Perhaps that has now been changed. For the good of the industry we sincerely hope so.

The American Gas Association is thoroughly democratic in that the lowliest employee of a gas company or a manufacturer company may become a member. The annual dues of individual members are only five dollars and, even though the member may not be able to attend the annual sessions, he is kept in touch with gas progress through being supplied from association headquarters in New York with a copy of its monthly publication.

Of course, the "sinews of war" are provided by the member companies which contribute funds in ratio to their sales somewhat along the lines of your National Gas Council, and by the manufacturer companies which are firms engaged in the manufacture of appliances and apparatus. But quite apart from the utilization of funds in research and advertising programs a great amount of educational work is accomplished through the thousands of A. G. A. members. Truly, these are an asset to the American gas industry.

Personnel Service

SERVICES OFFERED

Successful **Industrial Gas Engineer** desires position where a large potential market awaits progressive efforts and where results will be rewarded. Twenty-three years' experience Natural and Manufactured gas. Thorough knowledge all phases industrial applications, from steam boiler to steel mills. **895.**

Industrial Sales Engineer desires employment with Eastern Utility. Specialized in Sales Management, Service and Maintenance of House Heating Department, Industrial Steam Boilers and Large Volume Water Heating. Broad experience. Married. **897.**

Engineer, now employed offers manufacturer or utility ten years' experience all phases of heating and air-conditioning; designing, manufacturing, patents. Background 7 years' technical college faculty, national society committee activities, writing, and speaking; wide acquaintance in the industry. **898.**

Man of wide business experience, **sales engineer** prominent gas company. Services available November first. For several years official large contracting companies. Six years purchasing agent important manufacturing corporation. Five years executive secretary national trade association. Highest references. No preference as to place of residence. **901.**

Sales Engineer, one of the pioneers of gas House-heating sales with a background of gas plant operation. Have also had industrial sales, summer air conditioning, sales promotion and dealer relations experience. Prefer eastern states. Married. **903.**

Experienced gas **appliance salesman** (28), married, with good education, is desirious of locating with a public utility as sales supervisor or as district representative for a manufacturer. Have had experience in both ends. Prefer eastern states, but will go anywhere. Can furnish best of references. **904.**

Young energetic, **technical graduate** (29) (B. S. and M. S. in Mech. Engr.) with four years' utilization, distribution and construction experience with large natural gas system; married. **905.**

Experienced **gas range** engineering executive wishes to affiliate with reliable manufacturer. Capable of taking complete charge of design and experimental, laboratory departments, factory methods and correcting production problems. **908.**

Gas Appliance Salesman with ability to organize selling force, supervise, create selling plans and methods and conduct any territory in a judicious manner. Conversant with methods used in contracting wholesale and retail trade, also utility companies. **910.**

Industrial **Gas Sales Representative** (43). Adjusting, repairing, designing and selling appliances and burners to every industry. Manufacturer and gas utility experience, domestic and industrial. Married. **912.**

Engineer, broad experience in production, distribution, accounting and management; analysis distribution systems and preparation immediate or future extensions; making and testifying to inventories and valuations in rate and tax cases. Qualified install continuous inventory. **913.**

Salesman, electrical products (30), married, graduate electrical trade school. Eight years' experience New York City selling electrical appliances, specialties and material to industrials, public utilities, chain and department stores, realty companies, banks, jobbers and retailers. Also experienced sales promotion and missionary work. **914.**

Gas Engineer or **Superintendent,** college graduate, thoroughly experienced in the gas industry, including coal, water and oven gas manufacture, natural gas conversion work, pipe line construction maintenance and metering, high- and low-pressure distribution, also selling, installing and maintenance of house heating equipment. **915.**

Gas Engineer, 20 years' practical experience in all branches—manufactured and natural gas—holding company experience—highly successful in improving operating and distribution conditions. Recognized expert in federal court and commissions on appraisals and gas company operations. **917.**

SERVICES OFFERED

Graduate Engineer with eight years' experience in Public Utility operation and financing. Operating experience in all types of manufactured and natural gas, electric, water, and ice companies. Financial experience in organization of new and reorganization of old companies. **918.**

Junior Statistician, 10 years' experience public utilities. Versed in statistical routine, special reports, unit costs, special studies, preparation of forms in reporting or summarizing balance sheet, operating revenue and operating expense items, graphical presentation of results, reports for trade associations, Federal Trade Commission, etc. **919.**

Executive Manager (39). Technically trained university man; 18 years' experience available due consolidation of gas & electric properties. Broad experience, covering all phases of industry. Especial attention to Sales Promotion & Public Relations. **920.**

Exceptional experience as **Key Man** to executives suggests there is a similar position where knowledge of controlling corporate, financial, and legal requirements of corporations of different states, together with security sales promotion, modern budgets and statistical interpretation has a place. Can fully substantiate above at interview. **921.**

Personnel Director with deep convictions on value of public relations and employee's education, believing that a correctly informed public is a friendly public, that better trained employees insure stability and profits; all possible with low overhead. Have had ten years' experience in one of America's **largest utilities. Good references. 922.**

Accountant-Auditor, twenty years' diversified experience, home and abroad, on gas and oil, railways, foundries, sugar mills, general construction and bus transportation; five years last position handling consolidations, mergers and reorganization. Good personality, speaks and writes Spanish fluently. **923.**

Salesman thoroughly seasoned in domestic and industrial appliances, with refrigeration a specialty, seek connection eastern or midwest company. Fourteen years' experience all phases of appliance merchandizing—cold canvass, new business manager—advertising —cooking schools, married (38). **924.**

Young (24) **wide awake,** conscientious and ambitious. Five years' experience in analysis of utility operations, including sales and promotional activities plus three years' university training in advertising. Should fit well in advertising department of operating company, holding company, or manufacturer advertising agency. Single. **925.**

Salesman (35) 14 years' appliance experience with a background of both utility merchandising and manufacturer representative of ranges and space heater experience. Wishes to connect with reputable manufacturer to contact utility and dealer trade; well acquainted with Midwest. **926.**

General Office Worker (37) principally pay roll preparation, auditing and paymaster with large industrial organizations. Now employed and studying accounting at university night course; seeks change. **927.**

Executive engineer-accountant and commercial sales manager desires connection. Thorough experience with all branches of utility operation and **new business promotion.** Good public relations experience. Location no object. Thorough statistician—accountant. **928.**

Engineer-Secretary of gas and electric association in important progressive state. Has combined engineering, statistical and general organization and promotional work with appearances before committees, commissions and various types of audiences. Thoroughly familiar with state regulation and procedure, employee training, customer and trade relations work; available short notice. **929.**

Sales-New Business manager: Extensive training, experience initiating, directing advertising, publicity, sales campaigns; developing costs, rates, selling prices; supervising salesmen, commercial, public relations; outstanding record as industrial gas and power engineer; resourcefulness and ability to meet and solve new problems; highest credentials; salary secondary to connection offering good future prospects. **930.**

SERVICES OFFERED

Engineer—Eleven years in the gas industry. Familiar with manufacture and distribution in a large system, both high and low pressure. Also experienced in making investigations and unusual tests and have a proficient understanding of burner design and combustion. Well fitted for position as Superintendent or Manager. **931.**

Editor and **Writer.** Qualified for research, editorial work, writing, in business field. Have written correspondence courses and edited technical as well as general business material. Executive experience. **932.**

Gas Engineer with three years' experience in Latin America, understanding Spanish and thoroughly trained in manufacture, distribution, sales promotion, customer relations and industrial relations would like to make a connection with a company operating in Latin America. **933.**

Advertising Man (29), experienced in gas utility field. Competent advertising manager for smaller company or manufacturer or will fit well into a department. Copy writing, layout and publicity experience. Thorough knowledge of mechanics of production. Recommendation from previous employer. Record will stand closest scrutiny. Married. **934.**

Sales Manager—sales promotion manager—**salesman**—competent, aggressive, experienced, —for gas company or manufacturer wanting successful sales. Appliances, gas merchandise, gas distribution supplies, plumbing, heating specialties. Twelve years' effective selling, promoting, advertising, managing volume sales for leading specialty manufacturers. National gas company executive, jobber and consumer contacts. Mature college man. **935.**

Would like to **represent** a manufacturer of gas appliances in the metropolitan district. Long acquaintance with gas companies and other commercial outlets in New York City and vicinity. **936.**

Chemical Engineer, now employed, with 10 years of thorough experience in carburetted water gas plants. Familiar with latest equipment and processes including heavy oil operation, tar dehydration and gum control. **938.**

Young **Mechanical Engineering** Graduate (1934) desires position with engineering or manufacturing concern. Has ability to carry out instructions or use initiative as desired, and realizes he must earn a profit for his employer. **939.**

POSITIONS OPEN

Sales Representatives wanted. A large manufacturer of gas fired water heaters for over 20 years desires representation in Atlantic Coast and Southern States territory. Prefer those who are now representing other lines of gas appliances or lines in which a water heater will fit in successfully. Please give complete information in your application. **0278.**

Salesman: First-class salesman of proven ability wanted by one of the largest nationally known manufacturers of high-grade gas ranges. Please give experience and full details. **0280.**

Manufactured Gas Property in State of Washington want thoroughly experienced **gas utilization engineer.** Give complete record of experience and qualification. **0281.**

HAPPY NEW YEAR

In these momentous days, and with everything that simple phrase implies Personnel Service wishes you all a Happy New Year; may the lineage of *Services Offered* ever grow less and the *Positions Open* increase.

Personnel business is definitely picking up.

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